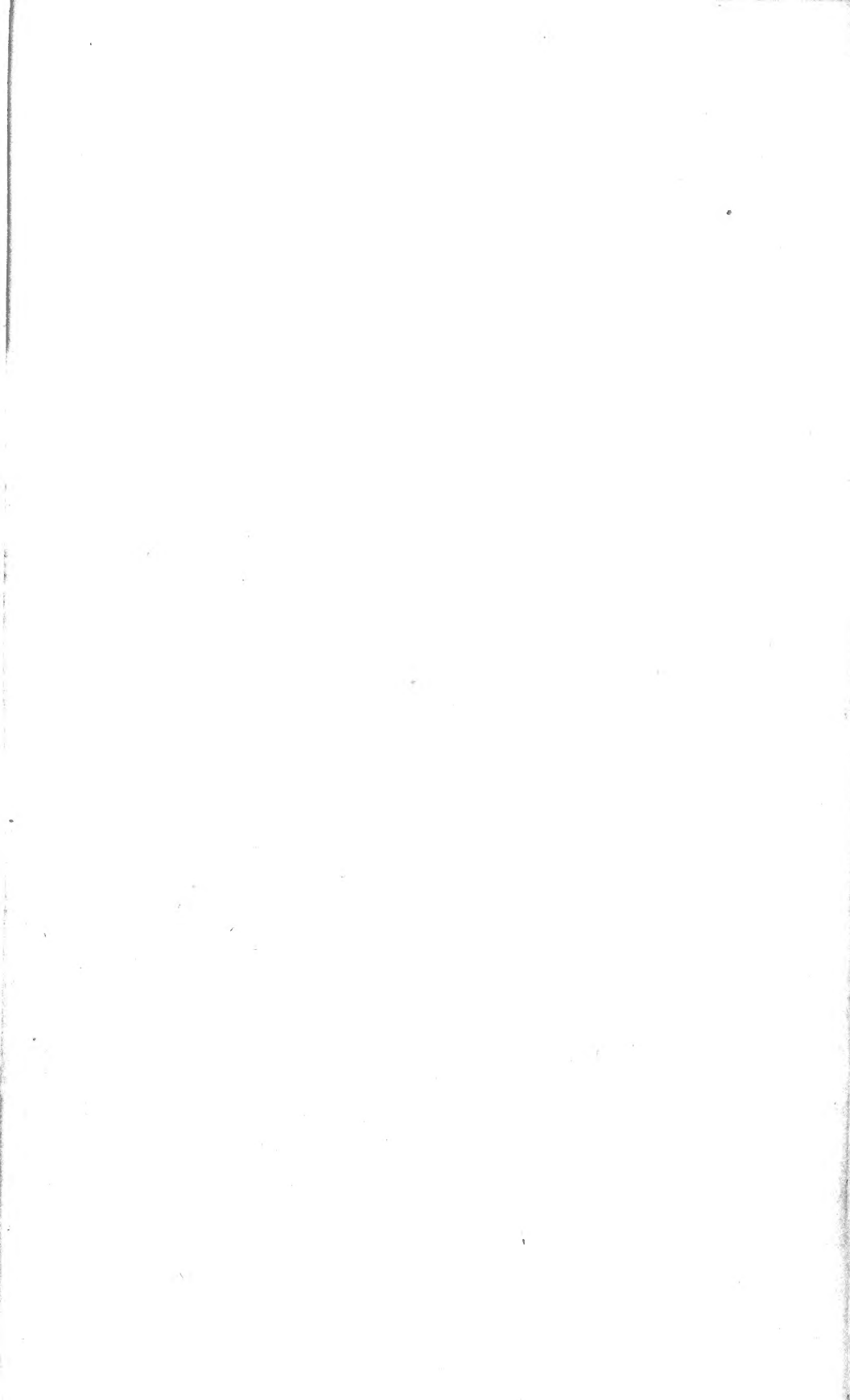
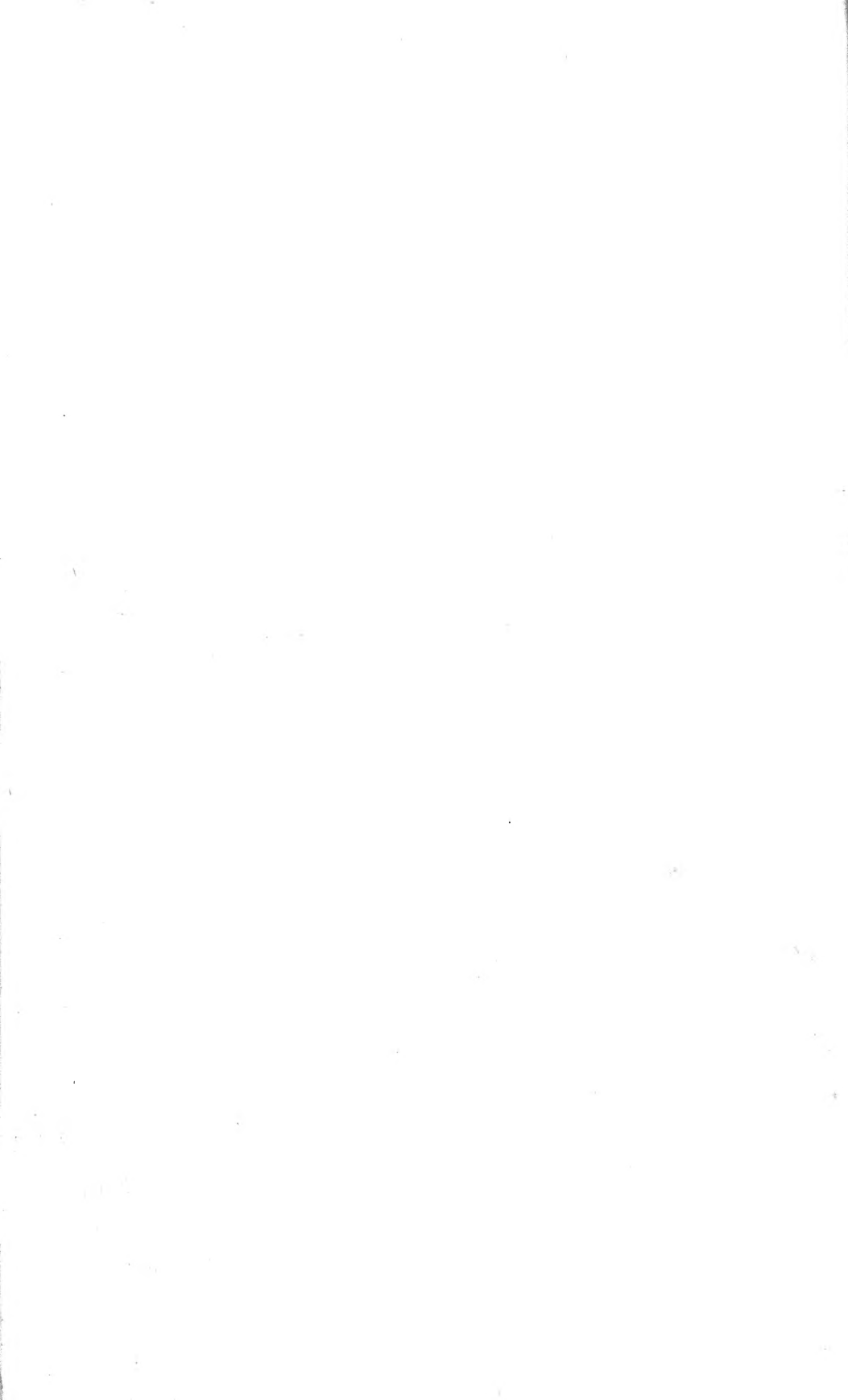


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N. S. Wales. Paterson's River, *R. Brown*; Lachlan and Macquarrie Rivers, *A. Cunningham*; New England, *C. Moore*, *C. Stuart*.

S. Australia. *Behr*; Spencer's Gulf, *R. Brown*; Torrens River, *F. Mueller*; Central Australia, *Gosse's Expedition*.

W. Australia. Murchison River, *Oldfield*.

Var. *densiflorus*. Stems not so stout and more evidently striate. Involucral bracts much shorter. Heads of spikelets small and crowded into a dense compound sessile cluster.—*C. gymnocaulos*, Steud. Syn. Glum. ii. 12 (erroneously described as digynous); *C. cruciformis*, Bœckel. in *Linnaea*, xxxv. 572

Victoria. Lalbert Lake and Murray River, *F. Mueller*; Wimmera, *Dallachy*.

S. Australia. Port Lincoln, *Bowen*; Alice Springs, Central Australia, *Giles*.

W. Australia. *Drummond*, n. 63, 334, 942; Champion Bay, *Grey*.

F. Mueller, *Fragm.* viii. 261, refers this species to the South African *C. textilis*, Thunb., that species however has a much looser and more compound inflorescence, the involucral bracts longer and more numerous, and the glumes of a pale colour with hyaline margins. *C. vaginatus* is perhaps nearer to the *C. marginatus*, Thunb., but I think distinct from both.

In a few of Leichhardt's specimens and in one of *Gosse's* the spikelets are very long with numerous thin pale-coloured glumes scarcely keeled, but the flowers are all abortive and the spikelets therefore in an abnormal state.

30. **C. holoschoenus**, *R. Br. Prod.* 215.—Stems from a thick horizontal or creeping rhizome, 1 to 2 ft. high, obtusely 3-angled. Leaves rather narrow, sometimes nearly as long as the stem. Spikelets small, in dense globular clusters or heads 2 to 3 lines diameter, in an irregularly compound umbel of 4 to 8 or even more rays, the longest 2 to 3 in. long. Involucral bracts 3 or 4, narrow, 1 to 2 of them longer than the inflorescence, the heads or clusters subtended by glume-like bracts. Spikelets flat, pale brown, shortly lanceolate or oblong, 1 to 1½ lines long, and fully 1 line broad, with 5 to 8 or rarely more flowers, the rhachis not winged or with an exceedingly narrow border. Glumes loosely imbricate, obtuse or almost acute, of a thin pale texture, striate with 2 or 3 fine nerves on each side. Stamens 3. Style 3-cleft. Nut obtusely 3-angled, nearly or quite as long as the glume.—*F. Muell. Fragn.* viii. 262.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Arnhem Land and Upper Victoria River, *F. Mueller*; between the Norman and Gilbert Rivers, *Gulliver*.

Queensland. Barcoo Downs, *Birch*.

31. **C. dactylotes**, *Benth.*—Stems usually rather stout and 2 to 3 ft. high, but sometimes more slender and scarcely above 1 ft., terete or obtusely 3-angled. Leaves rather long, but only sent with very few specimens. Spikelets numerous in dense clusters or heads, in a usually compound but very variable umbel, the longest rays often 6 in. long, the partial umbels very dense, Involucral bracts several, of which 2 to 4 longer than the inflorescence and 2 to 4 lines broad at the base. Spikelets linear, flat, very regular, usually 6 to 9 lines but sometimes at least 1 in. long, scarcely 1 line broad, of a light brown sometimes almost golden colour, with 30 to 50 or even more flowers, the rhachis not winged. Glumes loosely imbricate, not very broad, obtuse or the keel produced into a minute point, the sides more or less distinctly 2-

or 3-nerved, without scarious margins. Stamens 3. Style 3-cleft. Nut narrow, 3-angled, nearly as long as the glume.

N. Australia. Attack Creek, *M'Dougall Stuart*.

Queensland. Maranoa, *Woolfs*; Barcoo Downs, *Schmidt, Birch*; Armadillo, *Barton*.

32. *C. Gilesii*, Benth.—Stems 6 in. to 1 ft. high, slender, slightly triquetrous. Leaves much shorter. Spikelets in dense clusters in a simple umbel of about 6 rays, the longer ones about 1 in. long, or the whole inflorescence condensed into a compound sessile cluster. Involucral bracts few, of which 1 or 2 longer than the inflorescence. Spikelets linear or linear-lanceolate, very flat, elegantly pinnate, of a pale brown, $\frac{1}{2}$ to nearly 1 in. long, above 1 line broad, 20- to 40-flowered, the rhachis slender, not winged. Glumes loosely but regularly distichous, narrow, obtuse, but the pale-coloured or almost hyaline keel produced into a fine straight or recurved point, the sides very prominently 2- or 3-nerved, the lower glumes very deciduous, giving the older spikelets a pedicellate appearance, the 2 small ovate empty glumes remaining persistent at the base of the rhachis. Stamens 3. Style 3-cleft. Nut linear-oblong, more than half the length of the glume.

Central Australia. Charlotte Waters, *Giles*; Mitchell District, *Herb. F. Mueller*, collector not named,

33. *C. fulvus*, R. Br. Prod. 215.—Stems from under 1 ft. to above 2 ft. high, obtusely 3-angled. Leaves narrow, sometimes as long as the stem. Spikelets 6 to 12 together in dense heads or clusters in a simple or compound umbel of 5 to 10 rays, the longest rarely 2 in. long. Involucral bracts 2 usually longer than the inflorescence and sometimes very long, with 1 or 2 short ones. Spikelets very spreading, linear-lanceolate, rather acute, flat but rather thick, of a golden brown or pale coloured, 2 to 3 or rarely 4 lines long, about 1 line broad, 8- to 12-flowered, the rhachis not winged. Glumes loosely imbricate or at length rather spreading, narrow, obtuse or almost acute, with 2 or 3 prominent nerves on each side of the keel. Style 3-cleft. Nut oblong, 3-angled, more than half the length of the glume.—*F. Muell. Fragm. viii. 268*; *C. Sieberi*, *Kunth, Enum. ii. 96*.

Queensland. East Coast, *R. Brown*; Port Denison, *Fitzalan*; Rockhampton and various localities in S. Queensland, *Bowman, O'Shanesy, Leichhardt* and others.

N. S. Wales. *Leichhardt, Sieber, n. 630*; Shoalhaven Gullies, *C. Moore*; Camden and Richmond River, *Woolfs*; Gojunga Mountains, *Victorian Expedition*.

Central Australia. Charlotte Waters, *Giles*.

34. *C. carinatus*, R. Br. Prod. 216.—Stems 6 in. to $1\frac{1}{2}$ ft. high, obtusely triquetrous. Leaves much shorter, crowded in the tufts, rather broad, tapering to a fine point. Spikelets in dense clusters or heads in an umbel of few rays, the longest 1 to 2 in. long. Involucral bracts 3 or 4, of which 1 or 2 longer than the inflorescence and 1 often very long. Spikelets spreading, linear or linear-lanceolate, flat but rather thick, with a loose pinnate aspect, 4 to 6 lines long or when old

rather longer, nearly 2 lines broad, 10- to 30-flowered, the rhachis not winged or scarcely perceptibly bordered. Glumes not closely imbricated, short and rather broad, spreading, obtuse, the keel prominent and often produced into a short straight or recurved point, the sides 3- or 4-nerved. Stamens 3. Style 3-cleft. Nut obovate-oblong, 3-angled, more than half the length of the glume.

N. Australia. North Coast, *R. Brown*; M'Adam Range, *F. Mueller*; between Norman and Gilbert Rivers, *Gulliver*.

Queensland. Springsure, *Wuth*.

N. S. Wales. Liverpool range, *Leichhardt*; New England, *C. Stuart*; Mudgee, *Taylor*.

The species is very near *C. fulvus* with which it is united by *F. Mueller*, but the glumes are much shorter and broader as well as looser in the spikelets, giving the inflorescence a very different aspect approaching that of *C. alterniflorus*.

35. C. alterniflorus, R. Br. Prod. 216.—Stems rather stout, acutely 3-angled, 2 to 3 ft. high. Leaves often longer than the stem, 2 to 4 lines broad at the base, with very scabrous edges. Spikelets densely clustered as in the preceding species, but the common rhachis often slightly elongated, the clusters becoming short dense spikes, in a compound umbel of 6 to 10 rays, the longest 3 to 4 in. long, or all short and dense. Involucral bracts 1 or 2 very long, sometimes near 2 ft. and very scabrous like the leaves, with 1 or 2 short ones. Spikelets spreading, of a rich or a pale brown, linear, flat, 4 to 10 lines long, nearly $1\frac{1}{2}$ lines broad, 10- to 30-flowered, the rhachis not winged. Glumes narrow, spreading and very loosely imbricate, rather acute, the keel prominent, with 3 or 4 nerves on each side. Stamens 2 or 3. Style usually 3-cleft. Nut narrow, 3-angled, more than half the length of the glume.—*C. pictus*, Steud. Syn. Glum. ii. 43.

Queensland. Shoalwater Bay, *R. Brown*; Gracemere, *O'Shanesy*; King's Creek, *Bowman* (with spikelets above 1 in. long and 50- to 60-flowered).

S. Australia. Wulpena in the interior, *F. Mueller*.

W. Australia. *Drummond, n. 75 and 335.*

The species is allied to *C. carinatus* but readily known by the stature, acute-angled stem and long scabrous leaves and involucral bracts. The *C. pictus* was founded upon the western specimens, but upon a careful comparison I am unable to distinguish them from the eastern ones.

36. C. pilosus, Vahl; Kunth, Enum. ii. 80.—Stems from a thick rhizome 1 to 2 ft. high or rather more, stout and acutely 3-angled. Leaves sometimes as long as the stem and rather broad. Spikelets loosely spicate along the upper part of the rays of a rather compact umbel of 7 to 10 or more rays, the longest 2 to 3 in. long, the rhachis of the spikes angular and minutely hairy, the only instance of pubescence observed in the genus. Involucral bracts 4 or 5, of which one often very long and the 2 outer ones broad. Spikelets very spreading, of a pale brown, flat, linear-lanceolate, about 4 lines long, 10- to 16-flowered, the rhachis not winged or the angles with an exceedingly narrow border. Glumes pinnately spreading, rather acute, with a green keel and usually

2 nerves on each side. Style 3-cleft. Nut broad, acutely 3-angled, less than half the length of the glume.—Bœckel. in *Linnaea*, xxxv. 598; F. Muell. *Fragm.* viii. 260.

Queensland. Brisbane River, *F. Mueller*. Widely spread over tropical Asia.

37. **C. ornatus**, *R. Br. Prod.* 217.—Stems rather stout, 1 to 3 ft. high, obtusely triquetrous. Leaves long, but usually shorter than the stem. Spikelets loosely spicate or almost racemose, occupying nearly the whole of the secondary rays and some of the primary ones of a slightly compound umbel, the longest rays 3 to 4 in. long. Involucral bracts usually 2 or 3 much longer than the inflorescence, besides 1 or 2 short ones. Spikelets spreading, sessile or stipitate, of a rich brown, linear-lanceolate, 5 to 6 lines long, or in some Indian specimens twice that length, $1\frac{1}{2}$ lines broad, 12- to 20-flowered in Brown's specimen, 30- to 40-flowered in some Indian ones, the rhachis angled and notched but not winged. Glumes navicular but obscurely keeled, at first imbricate at length slightly spreading, obtuse or scarcely acute, of a uniform shining brown, but bordered by a white hyaline margin sometimes very narrow, sometimes broad at the apex. Style 3-cleft. Nut obovoid, triquetrous, about half the length of the glume.—*C. procerus*, Vahl according to Kunth, *Enum.* ii. 72, but not of Rottboell; *C. Heynei*, Bœckel. in *Linnaea*, xxxv. 600.

N. S. Wales. Hawkesbury, *R. Brown*. Found also in the Indian Peninsula and in Ceylon.

The species closely resembles a digynous species of the sections *Pycreus* generally referred to *C. puncticulatus* Vahl, and agreeing with his description, he does not however mention the number of style-branches nor the shape of the nut. Rottboell's *C. procerus* is probably a mere variety of *C. rotundus*.

38. **C. Iria**, *Linn.*; *Kunth, Enum.* ii. 38.—Stems tufted, 6 in. to $1\frac{1}{2}$ ft. high or rarely more, triquetrous. Leaves flaccid, shorter than the stem or rarely one longer. Spikelets loosely and irregularly spicate along the rays of a simple or compound umbel, either occupying nearly the whole ray or almost crowded into a terminal cluster, the longer rays from 1 to 3 in. Involucral bracts 3 or 4, of which 1 or 2 sometimes longer than the inflorescence. Spikelets linear-oblong, obtuse, flat, 2 to 5 lines long, 1 to $1\frac{1}{2}$ lines broad and 6- to 12-flowered in the common form, the rhachis not winged. Glumes loosely imbricate or at length distant, very obtuse, of a pale brown or yellowish green, the keel prominently 3- or 5-nerved, the sides broad and nerveless. Stamens 2 or 3, the filaments often united in a prominent hypogynous ring at the base. Style 3-cleft. Nut obovoid, prominently 3-angled, about as long as the glume.—Bœckel. in *Linnaea*, xxxv. 595; F. Muell. *Fragm.* viii. 266.

N. Australia. Sturt's Creek, *F. Mueller*.

Queensland. Port Denison, *Fitzalan*; Bowen Down, *Birch*.

Var. *flavescens*. Spikelets fewer in the spike but longer, with 12 to 16 flowers, assuming nearly the aspect of *C. flavescens*, although in some specimens 1 or 2 of the umbel-rays break out into the ordinary longer spike with few-flowered spikelets.

Central Australia, Gosse; Charlotte Waters, Giles; near Mount Murchison, Bonney.

The species is abundant in tropical Asia, extending northwards to China and Japan, and westward to East tropical Africa.

39. **C. eleusinoides**, Kunth, *Enum.* ii. 39.—Stems from a hard rhizome 2 ft. high or more, acutely 3-angled. Leaves with long sheaths covering the lower part of the stem, the lamina sometimes short narrow and rigid, sometimes broad and as long as the stem. Spikelets in dense close spikes occupying the whole or nearly the whole of the partial rays of a compound umbel which is usually narrow and irregular, the longer primary rays often 6 to 8 in. long and very erect. Involucral bracts few, 1 or 2 much longer than the inflorescence. Spikelets linear, flat, regularly pinnate, pale coloured, 4 to 5 or rarely 6 lines long, rather above 1 line broad, with 10 to 16 or rarely more flowers, the rhachis not winged or with a very narrow border. Glumes spreading, loosely imbricate or rather distant, somewhat scarious and often notched at the top, the prominent keel produced into a short point, and 2, 3 or rarely 4 nerves on each side. Style 3-cleft. Nut obovoid or oblong, prominently 3-angled, more than half the length of the glume.—Bœckel. in *Linnæa* xxxv. 596; *C. xanthopus*, Steud. in *Flora*, 1842, 595; F. Muell. *Fragm.* viii. 264 (partly).

N. Australia. Nebo, Gulliver.

Queensland. Port Denison, Fitzalan; Rockhampton and neighbourhood, Dallachy, O'Shanesy; Springsure, Wuth; Lockyer River, Hartmann.

The species is widely spread over East India and tropical Africa.

40. **C. distans**, Linn. f.; Kunth, *Enum.* ii. 93.—Stems 1 to 2 ft. high, slender or rather stout, triquetrous. Spikelets at first in narrow dense spikes, expanding into loose simple or branched racemes, in a simple or compound umbel, the rays few or many, slender or sometimes filiform. Involucre of few narrow bracts, 1 or 2 longer than the inflorescence. Spikelets very narrow, linear, $\frac{1}{2}$ to 1 in. long, loosely spreading when fully out, 10- to 20-flowered, the rhachis filiform, not winged. Glumes distant, appressed to the rhachis or rarely spreading, narrow, obtuse, the keel prominent with 1 or 2 nerves on each side, the broad or narrow margins pale and nerveless. Style 3-cleft. Nut oblong, 3-angled, nearly or quite as long as the glume.—Jacq. *Ic. Rar. t.* 299; Beauv. *Fl. Ow. et Ben. t.* 20; Bœckel. in *Linnæa*, xxxv. 612; F. Muell. *Fragm.* viii. 266; *C. elatus*, Rottb. *Descr. et Ic. Pl. t.* 10, not of Linn.

Queensland. Herbert's River, Dallachy, Bowman; Rockingham Bay, Dallachy; Rockhampton, O'Shanesy.

This species has something of the habit of a *Diclidium*, but the rhachis of the spikelets is not at all winged. It is very widely spread over the warmer regions of the New and the Old World.

C. subulatus, Sieb. *Agrostoth. n.* 145 is referred here by Kunth, but the synonymy is doubtful. All the specimens I have seen are in a very imperfect state, it certainly however is not *C. subulatus* Br., and is very probably West Indian.

SECTION IV. PAPHYRUS, Nees.—Spikelets flat or terete, with navicular or concave glumes, the angles of the rhachis bordered by scarious hyaline wings, decurrent from the margins of the glume immediately above, and frequently (but not always in the same species) becoming more or less detached from the rhachis as the flowering advances, then assuming the appearance of small scales one on each side of the ovary and sometimes described as such. Style 3-cleft. Nut equally 3-sided or rarely (in *C. tegetiformis*) dorsally compressed.

41. **C. tegetiformis**, Roxb. ; *Kunth, Enum.* ii. 56.—Rhizome creeping. Stems stout, 3 to 5 ft. high, triquetrous, the angles often acute in the upper part, leafless except the long loose sheathing scales at the base, the uppermost sometimes produced into a short lamina. Spikelets numerous and shortly spicate, in a compound umbel usually compact, the longer rays scarcely 2 in. long, but sometimes larger and looser. Involucral bracts few, 2 usually longer than the inflorescence and rather broad. Spikelets linear, not much flattened, 5 to 8 lines long, about 1 line broad, 16- to 24-flowered, the rhachis bordered by wings becoming frequently detached. Glumes ovate-oblong, obtuse, concave, scarcely keeled, the nerves very obscure, brown with pale but not hyaline margins. Style 3-cleft. Nut oblong, about half as long as the glume, more or less flattened, the inner face next the rhachis, the back convex but scarcely angled.—*C. Pangorei*, Hook. f. *Fl. Tasm. Præf.* 47, as to the Australian plant not of Rottb. ; *C. enodis*, Bœckel. in *Linnaea*, xxxvi. 271 ; *C. spaniophyllus*, F. Muell. *Fragm.* viii. 260, not of Steud.

N. Australia. Lower Victoria River, F. Mueller.

The species is also in East India. It has some of the characters of the section *Juncellus* but is too closely allied to the following two species to be separated from them. The *C. spaniophyllus* Steud. is the *C. malaccensis* Lam., which has similar glumes but a leafy stem, the rhachis of the spikelets not winged and equally 3-angled nuts.

42. **C. articulatus**, Linn. ; *Kunth, Enum.* ii. 53.—Rhizome often stoloniferous. Stems 1 to 2 ft. high, terete, marked with transverse septa which give it an articulate appearance, either leafless or the longest of the sheaths at the base produced into a short lamina. Spikelets 16 to 20 or more in loose clusters or short spikes in a simple or compound umbel of several very unequal rays, the longest 2 to 3 in. long. Involucral bracts 1 to 3, very short, linear-lanceolate or lanceolate. Spikelets linear, acute, slightly flattened, usually pale brown, varying from under $\frac{1}{2}$ in. to above 1 in. long, rarely 1 line broad, with from 18 or 20 to twice that number of flowers, the rhachis bordered by hyaline wings often at length deciduous. Glumes rather narrow, obtuse or rather acute, obscurely 3- or 5-nerved, the keel not very prominent. Style 3-cleft. Nut less than half the length of the glume, rather broad, triquetrous.—Bœckel. in *Linnaea*, xxxvi. 274.

N. Australia. Port Essington, Armstrong. Widely spread over tropical Asia, Africa and America, extending to the southern States of the N. American Union.

43. **C. diphyllus**, Retz, according to Bœckeler, in *Linnæa*, xxxvi. 273. Very closely allied to *C. articulatus*, and perhaps a variety, differing chiefly in the stem which is usually taller and stouter and shows no traces of the transverse septa or so-called articulations. The other characters are the same as in *C. articulatus*, the inflorescence as loose or sometimes close and compact, the spikelets, glumes, flowers and nuts the same, and the involucre bracts equally short.—*C. Kœnigii*, Vahl; Kunth, Enum. ii. 54; *C. corymbosus*, Hook. f. Fl. Tasm. Præf. 47 as to the Australian plant, not of Rottb.

N. Australia. Port Essington, *Armstrong*.

Central Australia, *Gosse*.

Var. *elator*, a stouter plant with a prominently 3-angled stem and 1 or 2 of the involucre bracts rather longer than the inflorescence.

Queensland. Rockhampton, *O'Shanesy*.

The species extends over a great part of East India. The var. *elator* approaches the *C. corymbosus*, Rottb., also East Indian, but that species has much more developed involucre bracts as well as some other minor differences.

44. **C. rotundus**, Linn.; Kunth, Enum. ii. 58.—Rhizome creeping or stoloniferous, swelling here and there into tunicated tubers, the scales when worn away leaving annular scars or zones. Stems rather slender, usually 1 to $1\frac{1}{2}$ ft. high, but sometimes short, triquetrous towards the top. Leaves rather narrow, much shorter than the stem, the sheaths often long and loose. Spikelets usually 6 to 10 together in clusters or short spikes in an umbel of few rays, the outer ones sometimes slender and 2 or 3 in. long but more frequently the umbel rather dense and sometimes almost contracted into a compound cluster. Involucre bracts few, 1 or 2 longer than the inflorescence. Spikelets usually of a rich brown, linear, acute, compressed but not very flat, usually about 5 or 6 lines long and rather above 1 line broad, with 12 to 20 flowers, but varying to a much greater length, the rachis slightly flexuose and bordered by rather broad hyaline wings either persistent or at length deciduous. Glumes imbricate, not very broad, obtuse or rather acute, more or less distinctly several-nerved, with a prominent keel usually green. Stamens 3. Style 3-cleft. Nut obovoid, 3-angled, less than half the length of the glume.—R. Br. Prod. 216; Sieb. Agrostoth. n. 112; F. Muell. Fragm. viii. 269; Bœckel. in *Linnæa*, xxxvi. 283; *C. hexastachyus*, Rottb. Descr. et Ic. Pl. 28, t. 14, f. 2; *C. littoralis*, R. Br. Prod. 216; Sieb. Agrostoth. n. 109.

N. Australia. Islands of the north coast, *R. Brown*; Arnhem Land, *F. Mueller*.

Queensland. Brisbane River, Moreton Bay, Rockhampton and numerous other localities in South Queensland, *F. Mueller*, *O'Shanesy*, *Mitchell* and many others.

N. S. Wales, Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others; New England, *C. Stuart*; in the interior to the north west, *A. Cunningham* and others; and to the Murray and Darling Rivers, *F. Mueller*, *Dallachy*, and others.

Victoria. Murray River, *F. Mueller*.

Central Australia, Charlotte Waters and Alice Springs, *Giles*.

W. Australia. Murchison River, *Oldfield*.

In some luxuriant specimens from Queensland as in some Indian ones, the stem is 2 ft. high, the umbel long and compound, the outer rays 3 to 6 in. long, the spikelets at length nearly 1 in. long with 20 to 30 flowers; in other smaller specimens from Dampier's Archipelago, *Walcott*, and from Central Australia the spikelets are fully 1 in. long; in others again from various localities the spikelets are rather small and the inflorescence very irregular as in *C. longus*, but the shape of the spikelets and of the glumes are those of *C. rotundus*. The following varieties are at first sight more distinct, but pass gradually into the more typical forms:—

Var. *carinatis*. Spikelets rather long, the keel of the glumes green, broad and very prominent, sometimes winged.—Rockingham Bay, *Dallachy*.

Var. *pallidus*. Spikelets short in loose spikes, very pale-coloured, the glumes almost hyaline.—Cygnets Bay, *A. Cunningham*, Tambo in Queensland, *Wuth*. This variety passes into, if it be not identical with, the European *C. esculentus*, Linn.; Kunth, Enum. ii. 61. To it belongs also *C. scariosus*, R. Br. Prod. 216, as to one sheet of his specimens labelled N. coast, another sheet from the east coast is more like the common *C. rotundus*, though with smaller spikelets. The third sheet, from the Gulf of Carpentaria, belongs perhaps to the *C. carinatus*, the rachis of the spikelets is not winged.

The species is abundantly spread over the tropical and temperate regions of the New and the Old World, varying in many places almost as much as in Australia and sometimes difficult to distinguish from *C. esculentus*, or from *C. longus*, but I do not think that the true *C. longus* has yet been detected in Australia.

C. Luerssenii, Boeckel, in Flora, 1875, 86, from Port Denison, *Amalia Dietrich*, must be very near some of the slender drawn-up specimens of *C. rotundus*. Boeckeler places it next to *C. dilutus*, Vahl, but describes a very different inflorescence and structure. Stem slender, 1 to 1½ ft. high. Leaves few, short, the lower ones reduced to sheaths. Umbel simple of 4 or 5 filiform rays, 2 to 3 in. long. Spikelets alternate at the end of the rays, 13 to 16 lines long and ½ line broad, with 16 to 24 flowers. Glumes green and several-nerved on the back, purplish on the sides. Nut scarcely half their length.

45. ***C. stenostachyus*, Benth.**—Rhizome thick and horizontal or creeping. Stems 2 to 3 ft. high. Leaves shorter, with rather long loose sheaths. Spikelets in clusters or short spikes in a rather compact umbel of several unequal rays, the longer ones 2 to 3 in. long and often bearing a secondary but dense umbel. Involucral bracts few, all shorter or one longer than the inflorescence. Spikelets linear, very flat, of a rich brown, 4 to 8 lines long, under 1 line broad, with 16 to 30 flowers, the rachis bordered by scarious wings. Glumes not broad, obtuse or the keel produced into a very short point, with 1 or 2 prominent nerves on each side, the brown nerveless margin usually rather broad. Stamens 3. Style 3-cleft. Nut obovoid, obtuse, triquetrous, not quite half the length of the glume.

W. Australia. *Drummond*, n. 935. The inflorescence and many characters are those of *C. rotundus*, but it is a much taller plant, and the scarcely acute crowded spikelets are narrower and yet much flatter than ever observed in that species.

46. ***C. congestus*, Vahl; Kunth, Enum. ii. 87.**—Stems rather

stout, 1 to 2 ft. high, acutely 3-angled in the upper part. Leaves shorter than the stem, with rather long sheaths, the lamina often 2 lines broad, with long points. Spikelets numerous, in very dense short spikes $\frac{3}{4}$ to 1 in. diameter, in an umbel of 3 to 6 or rarely more rays, the longest 3 to 4 in. long, or the whole inflorescence reduced to a dense sessile compound cluster. Involucral bracts several, of which 2 or 3 longer than the inflorescence and the outer one sometimes 2 to 3 lines broad; the bracts subtending the spikelets hyaline and persistent. Spikelets linear, spreading, brown, slightly flattened, 6 lines long or rather more, and about 1 line broad when fully out, with 10 to 16 or rarely more flowers, the rachis bordered by scarious wings often partially deciduous. Glumes loosely imbricate but scarcely spreading, obtuse or almost acute, keeled, with 3 or 4 nerves on each side. Stamens 3. Style 3-cleft. Nut broadly oblong, triquetrous, not quite half the length of the glume.—F. Muell. Fragm. viii. 269; *C. carinatus*, Nees in Pl. Preiss. ii. 72, not of R. Br.

N. S. Wales. Paramatta and Camden County, *Woolfs*.

S. Australia. King George's Sound, and neighbouring districts, *Oldfield*, *Maxwell* and others; Swan River, *Drummond*, *Preiss*, n. 1812.

The species is chiefly South African, it is very near *C. rotundus*, but appears constantly distinct. The West Australian specimens quite agree with the African ones, the eastern ones, of which I have seen but very few, may require further comparison.

47. **C. subulatus**, *R. Br. Prod.* 217.—Stems from a creeping rhizome rather slender, under 1 ft. high in the specimens seen. Leaves very narrow, often as long as the stem. Spikelets in dense clusters or short spikes in an umbel of few rays. Involucral bracts very narrow, almost filiform, 1 or 2 of them longer than the inflorescence. Spikelets brown, linear, acute, not very flat, 6 to 8 lines long and scarcely 1 line broad, 12- to 20-flowered, the rachis bordered by hyaline wings. Glumes rather narrow, erect but not very closely imbricate, acute or scarcely obtuse, the keel green, 3-nerved, or sometimes 5-nerved, the sides brown and nerveless. Style 3-cleft. Nut rather broad, triquetrous, more than half the length of the glume.

N. S. Wales. Port Jackson, *R. Brown*. The spikelets are nearly those of *C. rotundus*, but narrower and in denser clusters, and the species differs in foliage both from that and from *C. congestus*.

Var. confertus. Umbel rays few and short.

S. Australia. Lake Eyre, *Andrews*; Alice Springs, Central Australia, *Giles*.

48. **C. sporobolus**, *R. Br. Prod.* 215.—Stems usually rigid but not very stout, obtusely triquetrous, from under 1 ft. to $1\frac{1}{2}$ ft. high. Leaves much shorter. Spikelets in little globular heads or clusters in a compound umbel of 5 to 10 very unequal rays, the longer ones 1 to 3 in. long, the clusters or heads at first 2 to 3 lines diameter but expanding to 4 or 5 lines. Involucral bracts few, of which 2 or 3 much

longer than the inflorescence and sometimes very long. Spikelets spreading, flat, rarely above 2 lines long, with 5 to 8 flowers, the rhachis very short, but more or less distinctly bordered by hyaline wings. Glumes rather narrow, spreading, strongly several-nerved, the keel sometimes produced into a minute point. Style 3-cleft. Nut oblong, triquetrous, more than half as long as the glume.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; N. W. coast, *Hughan*; Upper Victoria River, *F. Mueller*; Port Darwin, *Schultz*, n. 791; Sweers Island, *Henne*; the latter specimens with rather larger spikelets and very spreading glumes.

C. sexflorus and *C. microcephalus*, *R. Br.* l. c. both from the same localities in the Gulf of Carpentaria, appear to me to be slight varieties of *C. sporobolus*, with smaller heads of spikelets and fewer flowers in each spikelet.

49. ***C. angustatus*, *R. Br. Prod.* 214.**—Stems rather slender, obtusely triquetrous, 1 to 3 ft. high. Leaves narrow, mostly shorter than the stem. Spikelets 4 to 10 together in close clusters in a compound spreading umbel of 6 to 10 or even more slender rays, the longest often 3 or 4 in. long. Involucral bracts narrow, 1 or 2 longer than the inflorescence and sometimes very long. Spikelets very spreading, linear, scarcely flattened, rather acute, brown or pale coloured, 4 to 8 lines long when fully out and scarcely above $\frac{1}{2}$ line broad, with 10 to 20 flowers, the rhachis bordered by narrow hyaline wings. Glumes appressed or rarely slightly spreading, rather narrow, the keel produced into a small point, the sides striate with 2 or 3 prominent nerves. Style 3-cleft. Nut narrow-oblong, sometimes slightly clavate, triquetrous, nearly as long as the glume.—*Bæckel. in Linnæa*, xxxviii. 366.

N. Australia. North coast, *R. Brown*; Port Darwin, *Schultz*, n. 259.

Queensland. King's Creek, *Bowman*; Gracemore, *O'Shanesy*; Bowen Downs, *Birch*.

50. ***C. Novæ-Hollandiæ*, *Bæckel. in Linnæa*, xxxvi. 344.**—Rhizome thick and hard. Stems stout, acutely 3-angled in the upper part, 3 to 4 ft. high. Leaves often longer than the stem, the sheath long, the lamina keeled below flat upwards and 2 to 3 lines broad. Spikelets numerous, in dense clusters or heads in a rather large compound umbel of 10 to 12 or more rigid rays the longest 3 or 4 in. long, the partial umbels dense. Involucral bracts few, 1 or 2 often 1 to 2 ft. long, and 2 to 3 lines broad, with very scabrous edges, the bracts under the partial umbels small and scarious. Spikelets spreading, usually light brown, linear, not very flat, rather acute, 4 to 6 lines long, scarcely $\frac{3}{4}$ lines broad, 10- to 20-flowered, the rhachis bordered by narrow hyaline wings. Glumes loosely imbricate but not spreading, rather narrow, obtuse or the keel produced into a very short point, the sides faintly nerved, brown with a pale margin. Style 3-cleft. Nut very narrow, triquetrous, as long as the glume or nearly so.

Queensland. Rockingham Bay, *Dallachy*; Rockhampton, *Thozet*.

C. inornatus, Bœckel. in Flora, 1875, 86, from Port Mackay, *Amalia Dietrich*, is placed by Bœckeler immediately before *C. Novæ-Hollandiæ*. In the long diagnosis including many characters common to the whole genus, I see nothing to distinguish it from that species.

51. *C. Gunnii*, Hook. f. *Fl. Tasm.* ii. 80, t. 140.—Stems usually rigid but not very stout, obtusely triquetrous, from under 1 ft. to 2 or sometimes 3 ft. high. Leaves few, sometimes as long as the stem, much narrower than in *C. lucidus*. Spikelets from 8 or 10 to twice that number, in dense globular clusters or heads in a simple or compound umbel of 6 to 10 rays, the longest 1 to 2 or rarely 3 in. long. Involucral bracts few and narrow, 1 or 2 from 6 in. to above 1 ft. long. Spikelets lanceolate, acute, flat, of a rich brown, 2 to 4 lines long and above 1 line sometimes nearly 2 lines broad at the base, 8- to 12-flowered, the rhachis bordered by narrow hyaline wings. Glumes loosely imbricate or at length spreading, rather acute, keeled, with 2 or 3 prominent nerves on each side. Style 3-cleft. Nut narrow, prominently 3-angled, not much shorter than the glume.—*C. compotinus*, Bœckel. in *Linnæa*, xxxvi. 333, not of R. Br.; *C. nodulosus*, F. Muell. in herb. plur.

N. Australia. Dampier's Archipelago, *A. Cunningham*, *Walcot*.

N. S. Wales. In the interior, *A. Cunningham*; New England, *C. Stuart*; Armidale, *Parrott*; Liverpool Plains, *C. Moore*.

Victoria. Goulburn and Purdie's Rivers, *F. Mueller*; Wendu Vale, *Robertson*; Wimmera, *Dallachy*.

Tasmania. Near Launceston, *Gunn*.

S. Australia. Mount Barker, *F. Mueller*.

F. Mueller unites this species with the *C. lucidus* to which it is nearly allied, but appears to me to be constantly different in inflorescence as well as in general habit. A specimen from Port Jackson in herb. R. Brown, there named *C. scaber*, but evidently not described in the *Prodromus*, appears to be the *C. Gunnii*.

C. Sieberi, Kunth, Enum. ii. 96, founded on Sieber's specimens of his *C. microcephalus*, Fl. Nov. Holl. n. 630, which I had at first, from Kunth's and Bœckeler's descriptions, referred to *C. Gunnii*, would appear, from a specimen I have since seen, to be rather a form of *C. foveus*.

C. Dietrichiæ, Bœckel. in Flora, 1875, 87, from Port Mackay, *Amalia Dietrich*, must also be very near if not identical with *C. Gunnii*. The inflorescence, the spikelets collected in dense globose heads, the winged rhachis, the long narrow nuts, answer perfectly well, except that the rays are described as more slender than I have seen them, and I do not understand the expression 'spiculis setaceo-tenerrimis.'

52. *C. lucidus*, R. Br. *Prod.* 218.—Stems stout, from 1 to 3 or even 4 ft. high, prominently 3-angled. Leaves often longer than the stem and $\frac{1}{4}$ to $\frac{1}{2}$ in. broad. Spikelets in spikes occupying the whole or the upper part of the secondary rays of a large and compound umbel of many rays, the longer ones sometimes 8 or 9 in. long, the spikes sometimes rather loose and $1\frac{1}{2}$ to 2 in. long, sometimes shorter and dense, the rays of the inflorescence both general and partial often not closely umbellate, the common rhachis more or less produced. Involucral bracts 3, 4 or more, the outer ones often very broad and above 1 ft.

long. Spikelets very spreading, of a rich brown, linear, flattened, acute, 4 to 6 or at length 7 or even 8 lines long, with 3 to 8 or rarely more flowers; the rhachis bordered by narrow hyaline wings. Glumes erect but not closely imbricate and sometimes at length distant, rather narrow, obtuse, the keel usually but not always pale coloured, the sides 2- or 3-nerved. Style 3-cleft. Nut oblong, prominently 3-angled, acuminate, rather shorter than the glume.—Bœckel. in Linnæa, xxxvi. 355; F. Muell. Fragm. viii. 270, partly; *C. sanguineofuscus*, Nees in Ann. Nat. Hist. ser. I, vi. 46, as to the Tasmanian plant; Hook. f. Fl. Tasm. ii. 80, t. 139.

Queensland. Moreton Bay, *F. Mueller*, *Leichhardt* and others; Boyne River, *Hartmann*.

N. S. Wales. Port Jackson, *R. Brown*, *Woolfs*; Clarence River, *Wilcox*; Hastings River, *Leichhardt*, *C. Moore*.

Victoria. Yarra River, *F. Mueller*; Wendu Vale, *Robertson*.

Tasmania. Common on river banks and in marshy places throughout the Island, *J. D. Hooker*.

The species appears to be limited to Australia, the Brazilian plant referred to it by Nees is evidently the same as *C. densiflorus*, Mey. or *C. Schraderianus*, Mart. referred by Nees to *C. mundulus*, Kunth, but incorrectly so according to Bœckeler. This Brazilian species is closely allied to the W. Indian *C. purpurascens*, Vahl, differing from *C. lucidus* in the shorter rather flatter spikelets, more numerous flowers, and shorter less acuminate nuts. Grisebach in his Flora of the British West Indies has unfortunately confounded this *C. purpurascens* with the very different *C. brunneus*, Sw. *C. acutus*, R. Br. Prod. 217, appears to be only a rather small state of *C. lucidus*, with fewer rather longer spikelets.

53. *C. pennatus*, Lam.; Kunth, Enum. ii. 80, but not of Bœckeler.—Stems $1\frac{1}{2}$ to $2\frac{1}{2}$ ft. high, 'obscurely triquetrous or almost terete. Leaves complicate at the base with rather long sheaths, ending in long slender points often exceeding the stem. Spikelets in dense spikes of $\frac{1}{2}$ to 1 in. in a compound umbel of many rays, the outer ones often 3 to 6 in. long. Involucral bracts 3 to 6, rather rigid, very scabrous on the edges, the outer ones often $1\frac{1}{2}$ ft. long. Spikelets very spreading, oblong-lanceolate, thick but more or less flattened, 3 to 5 lines long, $1\frac{1}{2}$ to 2 lines broad, pale coloured, 4- to 8-flowered, the rhachis bordered by broad hyaline wings. Glumes closely imbricate, broad, rather acute, concave, slightly keeled only above the middle, very obscurely nerved. Style 3-cleft. Nut obovoid, prominently 3-angled, nearly half the length of the glume.—F. Muell. Fragm. viii. 263; *C. canescens*, Vahl; Bœckel. in Linnæa, xxxvi. 340; *C. ventricosus*, R. Br. Prod. 217.

W. Australia. Fitzmaurice and Upper Victoria Rivers, *F. Mueller*; Port Darwin, *Schultz*, n. 159.

Queensland. Broad Sound, *R. Brown*; Port Mollé, *M. Gillivray*; Cape York, *Diemel*; Rockhampton, *Thozet*, *O'Shanesy* (with rather longer spikelets); Broadwater, *Eaves*.

Spread over East India, the Malayan Archipelago and the Pacific Islands. It has been identified as Lamarck's *C. pennatus* by Kunth, Decasino and others, and agrees perfectly with Poiret's original description, Dict. vii. 240. Bœckeler by some mistake refers Brown's *C. ventricosus* to the American and West African *C. ligularis*, Linn.

C. ochroleucus, Bœckel. in Flora, 1875, 85, from Lake Elphinstone, *Amalia Dietrich*, is placed by Bœckeler next to *C. pennatus* (*C. canescens*) and the description he gives, taken from a specimen in bud, shows no character by which I can distinguish it from that species.

54. **C. exaltatus**, Retz.; Kunth, Enum. ii. 70. — Stems stout, 1 to 3 ft. high. Leaves often longer, rather broad, but tapering into a long narrow point. Spikelets numerous, in loose spikes of 1 to 2 in. in a large usually compound umbel of many rays, the longer ones often 3 or 4 in. long. Involucre of few bracts, 1 or 2 much longer than the inflorescence. Spikelets linear, flat, of a shining brown or rarely pale and greenish, usually 2 to 4 lines long and scarcely 1 line broad, with 10 to 20 flowers, the rhachis bordered by hyaline wings often deciduous, the spikelets sometimes lengthening to $\frac{1}{2}$ in. with about 30 flowers and then when old appearing stipitate, the nuts with the glumes and wings of the rhachis having fallen away. Glumes closely imbricate, broad, the keel prominent and produced into a very short point with 2 or 3 obscure nerves on each side, the nerveless margins broad and rounded. Style 3-cleft. Nut prominently 3-angled, less than half the length of the glume.—Bœckel. in Linnæa, xxxvi. 319; F. Muell. Fragm. viii. 263; *C. venustus*, R. Br. Prod. 217.

N. Australia. North coast, *R. Brown* (with very narrow spikelets); Albert River, *Henne*; Flinders River, *F. Mueller*.

Queensland. Keppel Bay, *R. Brown*; Port Denison, *Fitzalan* (with long narrow spikelets); Rockingham Bay, *Dallachy*; Rockhampton and numerous localities in south Queensland, *Bowen*, *O'Shanesy*, *Thozet*, *Mitchell* and others.

N. S. Wales. New England, *C. Stuart*; Richmond River, *Woolfs*; Clarence River, *Beckler*, *Wilcox*; Darling River, *Victorian Expedition*.

Victoria. Broken and Murray Rivers, *F. Mueller*.

The species extends over East India and the Malayan Archipelago.

55. **C. hæmatodes**, Endl. Prod. Fl. Norf. 22.—Stems stout, acutely 3-angled, attaining 4 or 5 ft. Leaves long and broad, the largest said to be as long as the stem and 1 to $1\frac{1}{2}$ in. broad. Spikelets in densely crowded spikes in a large compound umbel of many rays, the longer ones attaining 6 to 8 in. or even more. Involucral bracts 6 to 8 or even more, the outer ones sometimes 2 to 3 ft. long and 8 in. broad. Spikelets spreading, linear-terete or scarcely flattened, acute, brown or pale-coloured, 6 to 8 lines or according to Endlicher sometimes 1 in. long, 10- to 16-flowered, the rhachis bordered by hyaline wings. Glumes imbricate, rather narrow and acute, erect and appressed, scarcely keeled, but striate with 7 or 9 prominent nerves, about 3 of the outer ones short and empty. Style 3-cleft. Nut oblong, triquetrous, more than half the length of the glume.—*C. congestus*, forma *gigantea*, F. Muell. Fragm. viii. 269.

N. S. Wales. Lord Howe's Island, *Milne*, *Fullagar*. Also in Norfolk Island. The Lord Howe's Island specimens are referred by F. Mueller to the *C. congestus*, but appear to me to differ from that species in habit and inflorescence as well as in the form of the spikelets.

56. *C. auricomus*, Sieb. in Spreng. Syst. i. 230.—Rhizome short and thick. Stems stout, triquetrous, 1 to 3 ft. high, the angles acute and sometimes almost winged under the inflorescence. Leaves rather broad, often as long as or longer than the stem, with long broad sheaths and ending in long narrow points. Spikelets in elongated spikes in a compound umbel of many rays, the longer ones often 3 in. long. Involucral bracts several, 2 of them much longer than the inflorescence. Spikelets spreading, linear-terete or scarcely flattened, pale-coloured, usually 3 to 6 lines long but sometimes twice as long, $\frac{1}{2}$ to $\frac{3}{4}$ line broad, 12- to 20-flowered, the rhachis bordered by hyaline wings. Glumes imbricate, narrow, shortly pointed, the keel prominent and obscurely 3-nerved, the nerveless sides pale brown or almost hyaline. Style 3-cleft. Nut oblong, obtuse, triquetrous, much shorter than the glume.—F. Muell. Fragm. viii. 263; *C. venustus*, Kunth, Enum. ii. 68, Bœckel. in Linnæa, xxxvi. 316, not of R. Br.

Queensland. Rockingham Bay, *Dallachy*; Port Curtis, *McGillivray*: King's Creek, *Bowman*.

Abundant in tropical Asia, extending to the South Pacific Islands and into tropical Africa, and very closely allied to but scarcely identical with the tropical American *C. giganteus*. It is also the n. 111 of Sieber's *Agrostotheca*, but his specimens are West Indian.

SECTION 5. DICLIDIUM, Nees.—Spikelets very narrow, terete or nearly so, either several-flowered with narrow concave closely appressed distant glumes, the rhachis flexuose and bordered by hyaline wings embracing the nut, or reduced to a single perfect flower, the winged rhachis however continued within the flowering glume and often protruding beyond it, with or without a terminal imperfect glume or rudimentary flower. Style 3-cleft. Nut equally 3-sided. After flowering the rhachis is often articulate at or near the base, the 2 small lower empty glumes either falling off with the spikelet or one or both remaining persistent.

57. *C. ferax*, Rich.; Kunth, Enum. ii. 89.—Stems usually stout, 1 to 3 ft. high, acutely or obtusely 3-angled. Leaves shorter or rarely as long as the stem. Spikelets numerous, in elongated spikes in a large compound umbel of numerous rays, the longest often 6 to 8 in. long. Involucral bracts several, long and sometimes broad. Spikelets linear-terete, very spreading, 5 to 10 lines long, mostly 6- to 10-flowered, the rhachis flexuose, bordered by hyaline wings and at length articulate below the lowest flowering glume and sometimes between each glume. Glumes distant, but closely appressed to the rhachis, narrow, obtuse or almost acute, concave, scarcely keeled, 7- or 9-nerved. Style 3-cleft. Nut obovoid-oblong, obtusely triquetrous, half as long as the glume and closely embraced within it by the wings of the rhachis.—Bœckel. in Linnæa, xxxvi. 399; *C. pennatus*, Bœckel. l. c. 404, not of Lam.

Queensland. Port Curtis, *McGillivray*; Mount Elliot and Daintree River, *Fitzalan*; Gracemere, *O'Shanesey*.

Widely spread over the tropical regions of the New and the Old World. I am unable to distinguish the two supposed species described by Boeckeler, and they should probably include several others. It was on the authority of a specimen named by Jussien that he referred this species to [the *C. pennatus*, Lam.; the original description however in the Encyclopædia is at complete variance and evidently relates to the above described *C. canescens*, Vahl, or *C. ventricosus*, Br. as correctly determined by Kunth and others.

C. lucidus, Nees; Kunth, Enum. ii. 89, but not of R. Br. was founded on Sieber's specimens, Agrostotheca, n. 110, supposed to be Australian and which Boeckeler, Linnaea, xxxvi. 364, refers to his *C. nitidulus*. These specimens however are West Indian, and appear to me to be the *C. ferax* with the spikelets in flower not yet fully developed.

58. **C. Bowmanni**, *F. Muell. Herb.*—Stems tufted, very slender, 1 to 1½ ft. high. Leaves much shorter, very narrow. Spikelets in short close spikes in an umbel of few slender rays, the longest about 2 in. long, the whole inflorescence sometimes reduced to the central sessile spike. Involucral bracts few, very narrow, 1 or 2 rather longer than the inflorescence. Spikelets rather numerous, linear-terete almost subulate, flexuose, 6 to 9 lines long and ending in a fine point, 6- to 10-flowered, the rhachis bordered by hyaline wings. Glumes distant, closely appressed to the rhachis, obtuse or scarcely acute, with a green rather broad keel, the sides brown and finely several-nerved. Style 3-cleft. Nut narrow, triquetrous, more than half as long as the glume, closely embraced within it by the wings of the rhachis.

Queensland. Brisbane River, Moreton Bay, *Bailey, Leichhardt* (the latter with rather broader leaves); Herbert's Creek, *Bowman*; Gracemere, *O'Shanesy*.

59. **C. trichostachys**, *Benth.*—Stems stout, about 2 ft. high, prominently 3-angled but quite smooth. Leaves mostly longer and rather broad. Spikelets in loose spikes of ½ to ¾ in. in a large umbel of numerous rays, the longer ones often 4 to 5 in. long. Involucre of several long bracts, the outer ones often 3 lines broad. Spikelets linear-filiform, spreading, 2 to 3 or rarely 4 lines long, usually 3- or 4-flowered, the rhachis flexuose and bordered by hyaline wings. Glumes distant, closely appressed to the rhachis, very narrow, acute. Style 3-cleft. Nut much shorter than the glume, very narrow, closely embraced by the wings of the rhachis.

Queensland. Rockingham Bay, *Dallachy*.

60. **C. leiocaulon**, *Benth.*—Stems rather slender, usually about 1 ft. high, obtusely triquetrous, quite smooth. Leaves much shorter, narrow. Spikelets in ovoid-globular rather dense spikes or rather looser and nearly ½ in. long, in a simple umbel of about 4 to 6 rays, the longest 1 to 2 in. long. Involucre of few bracts not much longer than the inflorescence. Spikelets linear-terete, at length flexuose and 3 or sometimes 4 lines long, with about 3 flowers, the rhachis bordered by hyaline wings. Flowering-glumes narrow, distant, closely appressed to the rhachis, striate with several nerves, the terminal one often empty or with an imperfect flower. Style 3-cleft. Nut narrow, closely embraced by

the wings of the rhachis. The spikelet falling away usually carrying off the second empty glume.—*Mariscus lævis*, R. Br. Prod. 218.

Queensland. Cape York, *Daemel*; Rockhampton, *O'Shanesy*.

N. S. Wales. Port Jackson, *R. Brown*; Richmond, *Woolfs*.

Very nearly allied to the following and possibly a variety only. Some specimens from Endeavour River, *Banks* and *Solander*, appear almost intermediate between the two.

61. *C. scaber*, *Benth.*—Stems 1 to 2 ft. high or rather more, triquetrous and usually very scabrous on the angles. Leaves usually shorter but sometimes longer than the stem. Spikelets in ovoid or shortly cylindrical spikes, in a compound umbel with numerous rays, the longest 2 to 6 in. long, the branches or partial rays divaricate. Involucral bracts several, often very long, the outer ones 2 to 3 lines broad. Spikelets slender, terete and often curved, either 1-flowered and about 2 lines long or flexuose with a second flower or empty glume at the end of the lower one, the rhachis within the glume bordered by hyaline wings, two outer empty glumes much narrower than in *C. umbellatus*, flowering glume or glumes narrow, striate, closely appressed to the rhachis. Style 3-cleft. Nut narrow, triquetrous, closely embraced by the wings of the rhachis — *Mariscus scaber*, R. Br. Prod. 218.

N. Australia. Gulf of Carpentaria, *R. Brown*.

Queensland. Rockingham Bay, *Dallachy*; Percy Island, *Walter*.

This and the preceding species, although formerly placed in *Mariscus*, have all the characters of *Dictidium*, with the second and third flowering glumes always distant, not overlapped by the lower one as in the section *Mariscus*.

SECTION 6. *MARISCUS*.—Spikelets small, terete or scarcely flattened, containing 1 or 2 perfect flowers, the very short rhachis bordered by hyaline wings and usually articulate near the base, the spikelet on falling off usually leaving a disk-like scar. Glumes imbricate, the lowest empty glume often remaining persistent, the second often falling off with the spikelet, the third or flowering glume wholly enclosing the continuation of the rhachis, or partially embracing the second flowering glume. Style 3-cleft. Nut triquetrous.

Although this section in some measure connects *Cyperus* with *Kyllinga*, it appears sufficiently distinct from the latter in habit, in the production of the winged rhachis above the single flower or between the two flowers of the spikelet and in the trimerous styles and fruit, and although the style is dimerous in the first two sections of *Cyperus*, it is then accompanied by other characters quite at variance with those of *Kyllinga*. Like the section *Dictidium*, it is a near approach in technical character to *Sclænus* though very different in habit.

62. *C. decompositus*, *F. Muell. Fragm.* viii. 267.—Stems prominently 3-angled, several ft. high. Leaves very long, 3 to 4 lines broad. Spikelets in very numerous small globular clusters in a very compound umbel of numerous rays, the longest 4 to 6 in. long. Bracts of the general involucre like the leaves, often 2 ft. long or more and 3 to 4 lines broad with scabrous edges, those of the secondary and ter-

tiary umbels small and setaceous. Spikelets not above $1\frac{1}{2}$ line long, narrow-ovoid, usually with 2 perfect flowers, the short rhachis bordered by broad hyaline wings. Glumes usually 5, imbricate, broad and striate, the two lower and the terminal one empty. Style 3-cleft. Nut ovoid, triquetrous, more than half the length of the glume.—*Mariscus decompositus*, R. Br. Prod. 218.

N. Australia. Gulf of Carpentaria, *R. Brown*.

Queensland. Endeavour Rivers, *Banks and Solander*, *A. Cunningham*; Rockingham Bay, *Dallachy*.

63. C. Armstrongii, Benth.—Stems from a thick tufted base varying from under 1 ft. to near 2 ft. high, stout and triquetrous. Leaves rather broad and sometimes very long. Spikelets in cylindrical spikes in a more or less compound umbel of numerous but not long rays. Involucral bracts long, rather rigid, sometimes 2 to 3 lines broad. Spikelets very numerous but not closely packed, spreading, narrow oblong, scarcely more than 1 line long, mostly with 1 perfect flower. Glumes imbricate, 4 or 5, the lowest small empty and persistent, the second empty but half as long as the flowering one and falling off with it, the third or flowering glume rather acute, finely striate, enclosing the short winged rhachis, the fourth glume shortly protruding, usually enclosing a male flower and sometimes a second male flower and glume above it. Style 3-cleft. Nut ovoid-oblong, triquetrous, nearly as long as the glume.

N. Australia. Port Essington, *Armstrong*; Port Darwin, *Schultz*, n. 731.

Queensland. Percy Islands, *A. Cunningham*; Rockingham Bay, *Dallachy*.

Very nearly allied to *C. Seemannianus*, Bæckel. from the Fiji Islands, but more rigid, the inflorescence much more compound and the spikelets smaller.

64. C. umbellatus, Benth. Fl. Hongk. 386.—Stems from under 1 ft. to nearly 2 ft. high, triquetrous, smooth. Leaves variable, narrow or rather broad, shorter or longer than the stem. Spikelets very numerous, in close cylindrical spikes of $\frac{1}{2}$ to 1 in. all sessile or mostly pedunculate in a simple umbel or very rarely 1 or 2 of them branched at the base. Involucral bracts usually several, much longer than the inflorescence, the outer ones sometimes 2 or 3 lines broad. Spikelets spreading, linear-terete, $1\frac{1}{2}$ to 2 lines long, almost always 1-flowered. Two outer glumes short and empty, both usually attached below the articulation; flowering glume occupying the whole spikelet, enclosing the flower and a continuation of the rhachis which with its wings assumes the appearance of an empty scarious glume. Style 3-cleft. Nut narrow, triquetrous, nearly as long as the glume and enclosed in it.—*F. Muell. Fragm. viii. 267*; *Mariscus umbellatus*, Vahl; Kunth, Enum. ii. 118; *Kyllinga umbellata*, Rottb. Descr. et Ic. Pl. 15, t. 4, f. 2; Beauv. Fl. Ow. et Ben. t. 55; *Kyllinga panicea*, Rottb. l. c. t. 4, f. 1.

Queensland. Condamine River, *Leichhardt*, and various localities in South Queensland, *Bouman*, and others; Brisbane River, *F. Mueller, Bailey*.

Var. laxiflora. Spikes longer and not so dense, 1 or 2 of the outer ones with a short branch at the base.—Herbert Creek, *Bouman*.

The species is widely distributed over tropical Asia and Africa, and may be the same as one of the South African ones. Bœckeler, *Linnaea*, xxxvi. 377, refers the *Mariscus umbellatus* of Vahl to the N. American *C. ovalaris*, Torr., which appears to me to be quite different. Vahl's *M. paniceus* and *M. umbellatus* were founded on Rottboell's Indian *Kyllinga panicea* and *K. umbellata*, the latter proving to be a larger variety of the former.

65. **C. conicus**, Bœckel. in *Linnaea*, xxxviii. 371.—Stems 1 to $1\frac{1}{2}$ ft. high, rather rigid, often much thickened at the base. Leaves often as long, rather rigid, ending in long subulate points, the margins scabrous and sometimes almost spinulose-denticulate. Spikelets very numerous, usually in dense sessile ovoid or conical heads, often 3-lobed at the base, 4 to 6 lines long and often as broad, in a simple umbel of 6 to 10 rays, the longest $1\frac{1}{2}$ to 2 in. long. Involucral bracts 3 to 5, long and tapering into long subulate points. Spikelets narrow-oblong, nearly $1\frac{1}{2}$ lines long, with 1 perfect flower. Glumes imbricate, the lowest empty glume small, very broad and cupshaped, scarious, remaining usually with the subtending small glume-like bract persistent after the spikelet has fallen off, the second empty glume ovate obtuse striate more than half the length of the spikelet; flowering glume almost acute, striate, closely enveloping the broadly winged rhachis and the base of a fourth glume which is empty or contains a male flower. Style 3-cleft. Nut ovoid, triquetrous, nearly as long as the glume.—F. Muell. Fragm. viii. 268; *Mariscus conicus*, R. Br. Prod. 218.

N. Australia. Gulf of Carpentaria, R. Brown; Port Darwin, Schultz, n. 603, 709.

Queensland. Port Curtis, M'Gillivray; Bokhara Creek, Leichhardt; Bowen Downs, Birch.

W. Australia. Murchison River, Oldfield.

Var. *ramosus*. Heads of spikelets branching into dense pyramidal panicles. Leaves numerous, broad at the base.—Sweers Island, Henne; Port Denison, Fitzalan.

C. glaucinus, Bœckel. in Flora, 1875, 89, from Port Mackay, Amalia Dietrich, from the character given does not appear to differ from *C. conicus*.

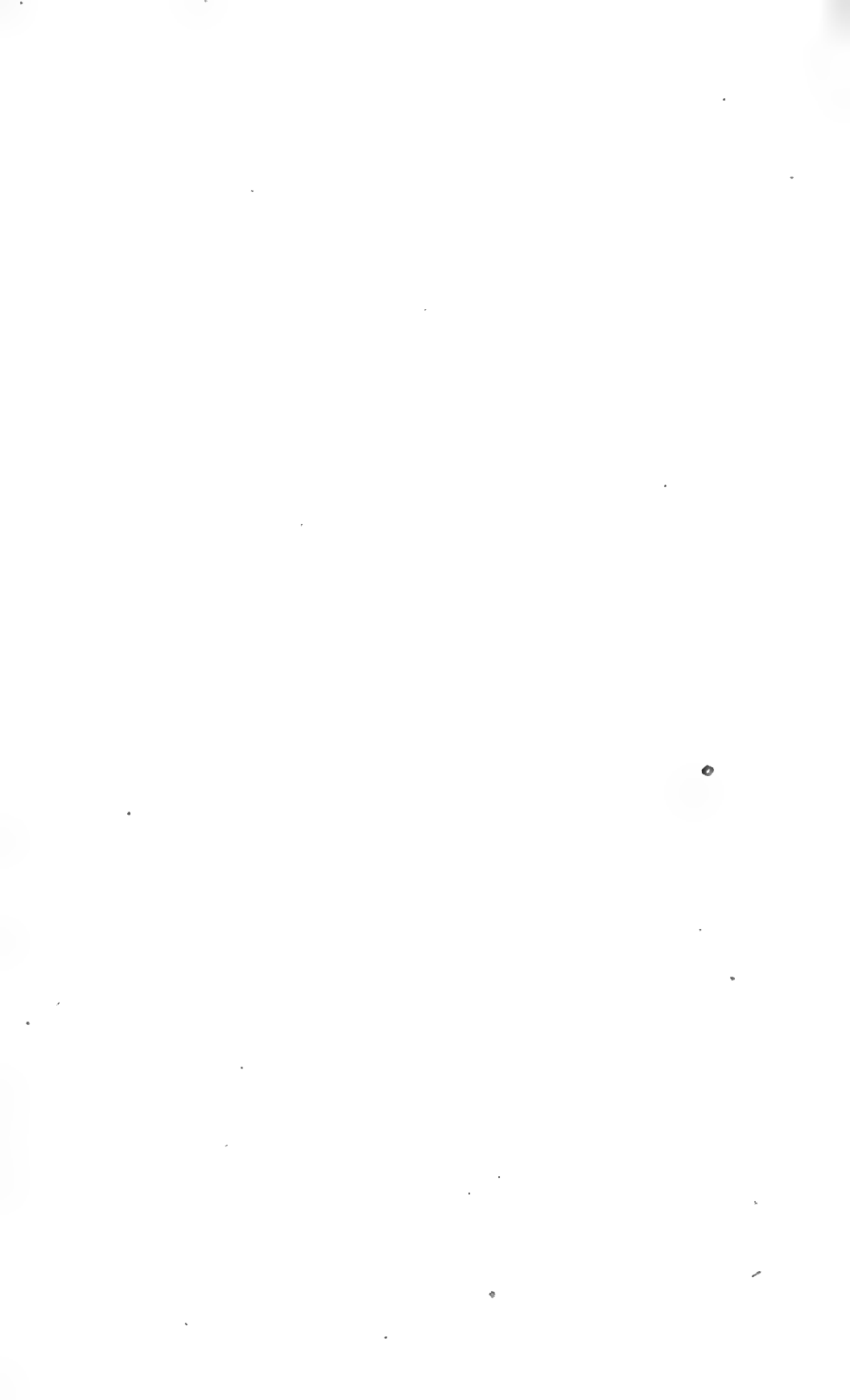
C. tetracarpus, Bœckel, l. c. 88, also from Port Mackay, Amalia Dietrich, must be very near the same species in many respects, but the spikelets are said to contain 4 or 5 flowers, which would remove it from the section *Mariscus*, where it is placed by Bœckeler next to *C. glaucinus*.

3. **HELEOCHARIS** (Eleocharis), R. Br.

(Scirpidium and Helcogenus (Elcogenus) Nees.)

Spikelet solitary, terminal, with many hermaphrodite flowers. Glumes imbricate all round the rhachis, the lowest 1 or 2 empty. Hypogynous bristles about 3 to 8, usually scabrous or ciliate with reflexed hairs, rarely deficient. Stamens 3, 2 or 1. Style dilated at the base, divided to above or below the middle into 2 or 3 filiform stigmatic branches. Nut obovoid or nearly globular and 3-ribbed, or more or less flattened and biconvex with 2 marginal ribs, always crowned by the conical or depressed persistent base of the style, the remainder of the style falling away.—Stems simple, tufted, without perfect leaves, the barren stems often taken for leaves, the real leaves reduced to sheathing scales,





of which the lowest are short brown and loose, the innermost (sometimes the only one) forming a long sheath closely appressed nearly or quite to its orifice. No involucre except the outer empty glume, which takes the place of a bract subtending the spikelet and is sometimes larger than the other glumes, very rarely produced into a short point.

Generally distributed over the tropical and temperate regions of the New as well as the Old World, two species extending to within the Arctic circle. Of the thirteen Australian ones three only are endemic, and one of these is scarcely more than a variety of a common one, three others are also in New Zealand and in some temperate regions in the northern or southern hemisphere, one has hitherto been only identified out of Australia in East India, the remaining six are common tropical or temperate species in the Old World and all, or all but one, are also in America.

SECT. I. *Limnocharis.* *Spikelets cylindrical. Glumes obtuse, not at all or very obscurely keeled, rather rigid, with a hyaline border. Persistent base of the style forming a conical usually flat beak to the nut.*

Stems terete, appearing articulate from the transverse septa dividing the internal pith. 1. *H. sphacelata.*

Stems continuous, obtusely triquetrous or terete.

Glumes almost white, scarcely striate, the hyaline border very narrow and soon disappearing, the spiral arrangement very prominent. 2. *H. spiralis.*

Glumes pale or dark, distinctly striate, the spiral arrangement not prominent. 3. *H. variegata.*

Stems continuous, acutely 3- or 4-angled. 4. *H. fistulosa.*

SECT. II. *Scirpidium.* *Spikelet cylindrical or tapering upwards, usually smaller than in Limnocharis. Glumes with a distinct green centre or prominent keel. Persistent base of the style shortly conical.*

Stem slender, acutely 4-angled. 5. *H. tetraquetra.*

Stem obtusely angled, or terete and striate.

Inner leaf-sheath truncate at the orifice with a small erect point. Nut biconvex.

Spikelet pale-coloured, obtuse. 6. *H. cylindrostachys.*

Spikelet usually dark coloured and rather acute. 7. *H. acuta.*

Inner leaf-sheath oblique at the orifice without the dorsal point.

Spikelet 6 to 8 lines long. No hypogynous bristles. Nut biconvex. 8. *H. atricha.*

Spikelets 3 to 5 lines long. Hypogynous bristles usually longer than the nut. Nut 3-ribbed. 9. *H. multicaulis.*

SECT. III. *Heleogenus.* *Spikelet ovoid-conical or small and few-flowered. Glumes keeled. Persistent base of the style short and depressed. Leaf-sheath oblique at the orifice, often scarious.*

Nut biconvex, very smooth. Glumes deciduous, usually numerous.

Spike dense, many-flowered, pale coloured. Stems mostly above 6 in. high. Glumes broad, with a green centre. 10. *H. capitata.*

Spike loose, dark-coloured, the glumes not very numerous, prominently keeled. Stems under 3 in. 11. *H. atropurpurea.*

Nut 3-ribbed and usually striate. Glumes not numerous. Stems short, filiform.

Leaf-sheath appressed to the orifice, usually brown. Spikelet narrow. 12. *H. acicularis.*

Leaf-sheath loose and scarious at the orifice. Spikelets rather broad 13. *H. pusilla*.

H. (E.) chaetaria, Roem. et Sch.; Kunth, Enum. ii. 140, an East Indian plant, is given by Boeckel. in Linnæa, xxxvi. 429, as also Australian on the authority of Sieber's specimens, Agrostotheca, n. 24, which Nees had named *E. recurvata*, given by Kunth as a synonym of *H. (E.) depauperata*, a West Indian and South American closely allied if not identical species. The only specimens I have seen have the spikelets too imperfect to determine to what species they belong, and their origin whether Australian or West Indian is very uncertain. If Australian they may prove to be the same as *H. pusilla*, Br. with which they agree as to the leaf-sheath.

SECTION I. LIMNOCHARIS, Nees.—Spikelet cylindrical, often large. Glumes obtuse, not at all or very obscurely keeled, rather rigid, with a hyaline border. Persistent base of the style forming a conical usually flattened beak to the nut.

1. **H. (E.) sphacelata**, R. Br. Prod. 224.—Rhizome creeping or stoloniferous. Stems from under 2 ft. to 4 or 5 ft. high, 2 to 5 lines diameter, terete but appearing articulate from internal transverse septa, the principal nodes $\frac{1}{2}$ to 1 in. distant, but several minor ones often appearing between them. Spikelet cylindrical, 1 to $2\frac{1}{2}$ in. long; 2 to 4 lines diameter. Glumes closely imbricate, broadly obovate, very obtuse, scarcely striate but sometimes faintly 1-nerved, bordered by a narrow scarious margin and immediately under it by a brown zone or dark line. Hypogynous bristles 6 to 9, usually longer than the nut. Style-branches 2 or 3. Nut rather broad, minutely pitted or granular but not distinctly striate, the flattened beak rather narrow, with a narrow ring round its base.—Kunth, Enum. ii. 154; Boeckel. in Linnæa, xxxvi. 475; Hook. f. Fl. Tasm. ii. 85; F. Muell. Fragm. viii. 239; *Scirpus sphacelatus*, Spreng. Syst. i. 204; *Heleocharis plantaginea*, F. Muell. Fragm. viii. 238, not of R. Br.

N. Australia. Gulf of Carpentaria, *R. Brown*; Arnhem Land, *F. Mueller*.

Queensland. Rockhampton (the tubers of the rhizome alimentary) *O'Shanesy*; Brisbane River, *Bailey*.

N. S. Wales. New England, *C. Stuart*; Clarence River, *Beckler*, *Wilcox*; Camden county, *Miss Atkinson*.

Victoria. Wendu Vale, *Robertson*; Emu Creek, *Whan*; Mittagong, *Travers*.

Tasmania. Derwent River, *R. Brown*; abundant in lagoons near Formosa and other localities, *Gunn* and others.

S. Australia, Barossa Range and Lake Torrens, *F. Mueller*.

The species is also in New Zealand and apparently in the Fiji Islands. It is very closely allied to the true *H. (E.) plantaginea*, Br., which ranges over the warmer regions of the New and the Old World, but has not the dark mark at the end of the glumes, and, in the specimens examined at least, the beak of its nut is much shorter. The *H. (E.) biseptata*, Steud. Syn. Glum. ii. 82 is probably the same as *H. sphacelata*.

2. **H. (E.) spiralis**, R. Br.; Kunth, Enum. ii. 155.—Stems almost terete or more or less triquetrous, continuous inside, $1\frac{1}{2}$ to 3 ft. high. Spikelets cylindrical, $\frac{1}{2}$ to 1 in. long, about 2 lines diameter, pale-coloured or almost white. Glumes broadly ovate in the Australian specimens, almost orbicular in the Indian ones, closely imbricate, with a spiral arrangement more evident than in any other species, very

faintly striate, very obtuse, with a narrow scarious margin which at length disappears. Hypogynous bristles about 6, glabrous or scarcely appearing scabrous under a $\frac{1}{2}$ in. lens. Style-branches 2 or 3. Nut obovate, compressed, biconvex, the beak or persistent base of the style shortly conical.—Bœckel. in *Linnaea*, xxxvi. 473; *Scirpus spiralis*, Rottb. Descr. et. Ic. Pl. 45, t. 15, f. 1.

Victoria? Tarampa Creek, *Herb. F. Mueller.*

The species is dispersed over the tropical regions of both the New and the Old World, but chiefly in tropical America.

3. H. (E.) variegata, *Kunth, Enum. ii. 153.*—Stems obtusely triquetrous or nearly terete, continuous inside, from under 1 ft. to nearly 2 ft. high, usually 1 to 2 lines but when luxuriant 3 lines diameter. Sheathing scale oblique and appressed at the orifice. Spikelets cylindrical, from $\frac{1}{2}$ in. long when in flower to nearly 1 in. when in fruit, $1\frac{1}{2}$ to $2\frac{1}{2}$ lines diameter. Glumes from very broadly ovate to obovate-oblong, very obtuse, not keeled, many-nerved, with a narrow scarious border, either wholly pale coloured or with a dark line within the border. Hypogynous bristles usually about 6, very unequal in length. Style-branches 2 or 3. Nut (not seen ripe in the Australian specimens) biconvex, broad, striate and slightly transversely rugose, the beak or persistent base of the style narrow-conical, flattened, with a broad annular base.—Bœckel. in *Linnaea*, xxxvi. 470; *Scirpus variegatus*, Poir. Dict. vi. 749; *H. (E.) Sieberi*, Kunth, l.c. *H. (E.) compacta*, R. Br. Prod. 224; F. Muell. Fragm. viii. 239; *Scirpus compactus*, Spreng. Syst. i. 202.

N. Australia. Arnhem N. Bay, *R. Brown*; Lower Victoria River, *F. Mueller.*
Queensland. Rockingham Bay, *Dallachy*; Narran River, *Mitchell.*

The species is widely spread in tropical and subtropical regions in the Old World and is also in tropical America. The characteristic dark zone on the glumes is very conspicuous in Brown's specimens, less so in the others. Mitchell's specimens may be doubtful, they are in flower only, the glumes are pale with a scarious border and the dorsal vein more conspicuous than is usual in the species.

4. H. (E.) fistulosa, *Schult. ; Kunth, Enum. ii. 155.*—Stems continuous inside, acutely and equally 3-angled or unequally 4-angled, 1 to 2 ft. high, $1\frac{1}{2}$ to 2 lines diameter. Spikelets cylindrical, often fully 1 inch long, $1\frac{1}{2}$ to 2 lines diameter. Glumes imbricate but not very dense, ovate, obtuse but often narrower than in *H. variegata*, obscurely keeled, striate, bordered by a narrow scarious margin sometimes almost obsolete. Hypogynous bristles about 6. Style-branches 2 or 3. Nut broad, biconvex, striate and pitted between the striæ, the beak or base of the style flat-conical, short, with a raised annular base.—Bœckel. in *Linnaea*, xxxvi. 472; F. Muell. Fragm. viii. 239.

Queensland. Rockhampton, *Bowman, O'Shanesy.*

Widely spread over the tropical regions both of the New and the Old World, and the N. American *H. (E.) quadrangulata*, Br. is but very slightly different. The few Australian specimens have certainly four angles to the stem, but two of them appear (in the dried state) close together, passing into the ordinary 3-angled form.

SECTION II. SCIRPIDIUM. Spikelet cylindrical and obtuse or tapering upwards and acute, usually smaller than in *Limnochloa*. Glumes with a distinct green centre or prominent keel. Persistent base of the style forming a short conical often laterally flattened beak.

5. **H. (E.) tetraquetra**, Nees : *Kunth, Enum.* ii. 150.—Stems slender, acutely 4-angled, usually about 1 ft. high. Inner sheathing scale appressed and truncate at the orifice with a minute erect point on one side as in *H. acuta*. Spikelet oblong-lanceolate, 3 to 4 lines long, 1 to $1\frac{1}{2}$ lines diameter. Glumes rather more obtuse than in *H. acuta*, with a green centre, brown sides, and narrow scarious margins. Hypogynous bristles about 6, as long as the nut. Style-branches 3. Nut obovoid, 3-ribbed, smooth, the conical beak or base of the style somewhat flattened.—Bœckel. in *Linnæa*, xxxvi. 447 ; F. Muell. *Fragm.* viii. 239.

N. S. Wales. Richmond River, *Miss Atkinson*, the specimens in young flower, the characters therefore chiefly taken from East Indian ones. The species has there a wide range. It is very near *H. acuta* but constantly known by the acutely angular stem.

6. **H. cylindrostachys**, Bœckel. in *Flora*, 1875, 108 (from the char. given).—Stems terete, rather stout, mostly above 1 ft. high when full grown. Inner sheathing scale closely appressed, truncate at the orifice with an erect point of $\frac{1}{2}$ to $1\frac{1}{2}$ lines as in *H. acuta*. Spikelet oblong-cylindrical, obtuse, 6 to 9 lines long when fully out, scarcely 2 lines diameter, very pale coloured. Glumes very numerous and closely imbricate, ovate-oblong, very obtuse, scarious with thin hyaline margins, the green central nerve more or less distinct, otherwise nerveless, scarcely coloured or faintly tinged with brown, very deciduous as in *H. capitata*. Hypogynous bristles 6 to 8, mostly longer than the nut. Style branches 3 or rarely 2. Nut broadly obovate, usually much flattened, the beak or base of the style broadly conical and flat.

Queensland. Wide and Moreton Bays, *Leichhardt* ; Rockhampton, *Thozet* ; Boyne River, *Hartmann* ; Castle Creek, *Bunce*.

N. S. Wales. Camden and Richmond, *Woolfs* ; New England, *C. Stuart* ; Clarence River, *Wilcox*.

These specimens are referred by F. Mueller, *Fragm.* viii. 240, to *H. (E.) obtusa*, Schult. which Bœckeler is probably right in reducing to the common *H. ovata*, Br. Our species however appears to be constantly distinct in the long narrow pale spikelet with very deciduous glumes, which I do not find in any of our European Asiatic or American specimens of *H. ovata* or *obtusa*.

7. **H. (E.) acuta**, R. Br. *Prod.* 224.—Rhizome creeping. Stems rather slender, terete, from 6 or 8 in. to $1\frac{1}{2}$ ft. high or rather more. Sheathing scale appressed and horizontally truncate at the orifice, the edge often dark coloured, with a small erect point or rudimentary lamina $\frac{1}{2}$ to 1 line long, inserted usually on one side, immediately below the margin. Spikelet linear-oblong or lanceolate, rather acute, from under $\frac{1}{2}$ in. to nearly 1 in. long. Glumes obtuse or almost acute, the

dorsal nerve or keel more or less prominent, the sides brown with pale more or less scarious margins. Hypogynous bristles 3 to 7, usually 5 or 6, longer or shorter than the nut. Style-branches usually 3. Nut obovoid or almost orbicular, very convex on both sides, but without the third angle of *H. multicaulis*.—*H. (E.) mucronulata*, Nees in Ann. Nat. Hist. ser. i. vi. 46; Bœckel. in Linnæa, xxxvi. 466; *H. (E.) gracilis*, Hook. f. Fl. Tasm. ii. 85, not of R. Br.; *H. palustris*, F. Muell. Fragm. viii. 240, not of R. Br.; *Scirpus acutus* and *S. tener*, Spreng. Syst. i. 203, 204.

Queensland. Endeavour River, *Banks and Solander*; Plains of the Condaminé, *Leichhardt*; Gracemere, *O'Shanesy*.

N. S. Wales. Port Jackson, *R. Brown*; New England, *C. Stuart, Perrott*; Richmond River, *Miss Hodgkinson*; between the Lachlan and Darling Rivers, *Victorian Expedition*.

Victoria, *Robertson*; Skipton, *Whan*; Wimmera, *Dallachy*.

Tasmania. Dorwent River, *R. Brown*; abundant in marshy places throughout the island, *J. D. Hooker* and others.

S. Australia. Bothanic, *Behr, F. Mueller*; Angas River, *F. Mueller*.

W. Australia. Various stations from King George's Sound to Swan River, *Drummond, n. 100, 364, F. Mueller*, and others.

Var. pallens. Spikelet of a very pale brown, the glumes almost scarious, but the shape of the spikelet, the number and shape of the glumes and other characters, those of *H. acuta* not of *H. cylindrostachys*.—Upper Victoria River, *F. Mueller*; Bowen Downs, *Birch*; beyond the Darling and near Mount Murchison, *Victorian Expedition*. To this variety may probably belong the *H. Dietrichiana*, Bœckel. in Flora, 1875, 107, from Rockhampton, *Amalia Dietrich*.

The typical form of *H. acuta* occurs in New Zealand, and some specimens from Chile and other parts of extratropical South America appear to be the same species. I have not as yet been able to ascertain whether they have been as yet published under any or what name.

8. H. (E.) atricha, R. Br. Prod. 225.—Stems slender, tufted, striate, under 1 ft. high. Sheathing scale long, rather loose, oblique at the orifice as in *H. multicaulis*, but the habit of the plant rather of *H. acuta*. Spikelet linear, cylindrical, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Glumes obtuse, the dorsal midrib scarcely prominent, the margins with a very narrow scarious border and just within it a brown line. No hypogynous bristles. Style-branches 2. Nut much flattened, but convex on both sides, broadly obovate, elegantly pitted in numerous vertical rows, the base of the style surrounded by a very prominent border.—*F. Muell. Fragm. viii. 252*.

N. Australia. Between Norman and Gilbert Rivers, *Gulliver*.

N. S. Wales. Port Jackson, *R. Brown*; New England, *C. Stuart*.

9. H. (E.) multicaulis, Sm. Engl. Fl. ii. 64.—Stems from a creeping rhizome usually more slender or weaker than in *H. acuta*, rarely above 1 ft. long, and often much shorter. Inner leaf-sheath appressed, but the orifice slightly dilated, oblique and sometimes almost lanceolate, obtuse or acute without any distinct point. Spikelet oblong or almost ovate-oblong, 3 to 4 or rarely 5 lines long, 1 to $1\frac{1}{2}$ lines broad. Glumes oblong, $1\frac{1}{2}$ to 2 lines long, obtuse or the upper ones acute, the

keel usually green, the sides brown, scarious, hyaline towards the edge. Hypogynous bristles 6 or fewer, usually longer than the nut. Style-branches 3. Nut obovoid-triquetrous, the dorsal rib as prominent as the lateral ones.—Kunth, Enum. ii. 149; Reichb. Ic. Fl. Germ. t. 296; Bœckel. in Linnæa, xxxvi. 457; *H. (E.) gracilis*, R. Br. Prod. 224; *H. gracillima*, Hook. f. Handb. N. Zeal. Fl. 745.

N. S. Wales. Port Jackson, *R. Brown*, *C. Moore*, *Woolfs*.

Victoria. Goulburn River, *F. Mueller*.

S. Australia. Lofty Range, *F. Mueller*.

W. Australia. *Drummond*, n. 137, appears to be a dwarf state of this plant, but the specimens are not in a state for absolute determination.

If I am correct in the identification of this species it is also in north-western Europe and in New Zealand. Can it have been introduced from Europe? Sieber's specimens, *Agrostotheca*, n. 115, named by Noes as *E. gracilis*, referred by Kunth to *H. (E.) maculosa*, and published by Bœckeler as a distinct Australian species under the name of *H. gracillima*, are West Indian.

SECTION 3, HELEOGENUS. Spikelet ovoid-conical or small and few-flowered. Glumes with a prominent or greenish keel. Persistent base of the style short and depressed. Inner leaf-sheath oblique at the orifice, often scarious.

10. *H. (E.) capitata*, R. Br. Prod. 225.—Stems usually densely tufted, from under 6 in. to nearly 1 ft. high, slender, striate. Inner leaf-sheath short, appressed or rather loose, oblique at the orifice. Spikelet ovoid-conical or nearly globose, pale-coloured, rarely above 2 lines diameter. Glumes numerous, all including the 1 or 2 outer empty ones very deciduous, ovate, obtuse, more or less scarious, with a broad more opaque or greenish centre or dorsal nerve scarcely forming a prominent keel. Style-branches 2 or rarely 3. Hypogynous bristles 5 to 8, longer or shorter than the nut. Nut obovoid, biconvex or the inner face nearly flat, shining, crowned by the very small persistent depressed base of the style.—Kunth, Enum. ii. 150; Bœckel. in Linnæa, xxxvi. 461; *F. Muell. Fragm.* viii. 240.

N. Australia. Gulf of Carpentaria, *R. Brown*; Sea range and Victoria River, *F. Mueller*.

Queensland. Endeavour River, *Banks and Solander*.

W. Australia. Murchison River, *Oldfield*.

The species is widely spread over the warmer regions of the New and the Old World.

H. (E.) setacea, R. Br. l. c. (*Scirpus Brownei*, Spreng. Syst. i. 204) from Endeavour River, *Banks and Solander* does not appear to me to differ from slender specimens of *H. capitata*.

11. *H. (E.) atropurpurea*, Kunth, Enum. ii. 151.—Stems densely tufted, slender often filiform, 1 to 3 in. high. Inner leaf-sheath appressed, the orifice oblique, acuminate or lanceolate, in some specimens scarious and at length lacerated, in others green. Spikelet ovate, slightly compressed, attaining about 2 lines in length and $1\frac{1}{2}$ lines broad at the base, or in the smaller forms, 1 line long and $\frac{3}{4}$ line broad.

Glumes loosely imbricate or almost spreading, not numerous, deciduous, acute, the keel prominent and green, the sides dark brown and nerveless. Stamens 1 or 2. Style-branches 2. Hypogynous bristles usually 4 sometimes 5 to 8 in the typical form, and as long as the nut, very short or entirely wanting in some varieties. Nut small, obovate, biconvex, smooth and shining, at length dark brown or black, crowned by the small depressed persistent base of the style.—Bæckel. in *Linnaea*, xxxvi. 458; F. Muell. *Fragm.* viii. 240.

N. Australia. Victoria River, *F. Mueller*.

Queensland. Brisbane River, *Bailey*.

N. S. Wales. Richmond River, *C. Moore*.

Var. *setiformis*. Stems filiform, under 2 in. high. Bristles very short or none.—Carron's Creek, Carpentaria, *Gulliver*; Rockhampton, *O'Shanesy*.

The species is spread over the tropical and temperate regions of the Old World, and is, perhaps, in America also.

12. H. (E.) acicularis, *R. Br*; *Kunth*, *Enum.* ii. 141.—Stems tufted, rarely slightly stoloniferous, filiform, 1 to 3 in. high in the typical form. Inner leaf-sheath appressed to the orifice, which is oblique obtuse and very thin though green and not scarious. Spikelet lanceolate, acute, 1 to 2 lines long, dark brown. Glumes few, ovate, obtuse or almost acute, the keel scarcely prominent usually pale, the sides brown, nerveless, with narrow scarious margins. Stamens 3. Style-branches 3. Hypogynous bristles few. Nut small, obovoid, not compressed, 3-ribbed, slightly striate and transversely rugulose, crowned by the small depressed base of the style.—Bæckel. in *Linnaea*, xxxvi. 431.

Victoria. Edward's River, *F. Mueller*. The specimens not yet in fruit, but apparently referrible to the true *H. acicularis*, which is common in tropical and temperate regions, in the New as well as the Old World.

Var. *elongata*. Stems 8 to 10 in. long, but filiform with the brown appressed sheaths of the European plant.

13. H. (E.) pusilla, *R. Br. Prod.* 225.—Very near *H. acicularis* and, perhaps, a variety as suggested by *F. Mueller*. Stems in tufts but on a slender creeping rhizome, 1 to 3 in. high, filiform. Inner leaf-sheath appressed except at the orifice which is loose scarious and oblique. Spikelet oblong-lanceolate, brown, few-flowered, 1 to 2 lines long. Glumes few, obtuse, with a broad pale dorsal keel, the sides of a rich brown, the margins scarious. Hypogynous bristles very small or none. Stamens usually 3. Style-branches 3. Nut obovoid, striate, transversely pitted, with 3 prominent ribs.—*H. acicularis*, var. *F. Muell. Fragm.* viii. 240; *E. recurvata*, *Nees*, in *Sieb. Agrostoth.* n. 24?; *Scirpus pumilio*, *Spreng. Syst.* i. 204.

N. S. Wales. Port Jackson, *R. Brown*.

Victoria. Bacchus Marsh and Mount Emu Creek, *F. Mueller*.

Tasmania. South Esk River, *C. Stuart*.

4. **FIMBRISTYLIS**, Vahl.

(Trichelostylis and Oncostylis, Nees.)

Spikelets solitary capitate or irregularly umbellate, with several usually many flowers, all hermaphrodite or rarely the upper ones female only. Glumes imbricate all round the rhachis or rarely distichous, the lowest 1 or 2 rarely 3 or 4 empty. No hypogynous bristles. Stamens 3, 2 or 1. Style flattened and ciliate or slender, with a conical or bulbous-shaped base, articulate on the ovary and falling off with the style, or (in *Oncostylis*) remaining persistent on the ovary long after the style has fallen away; stigmatic branches 2 or 3, filiform. Nut obovoid globular or more or less flattened and biconvex, often much contracted at the base.—Tufted annuals or perennials, never so large as the larger *Scirpi*. Leaves narrow, radical or at the base of the stem, sometimes reduced to membranous or rather rigid sheathing scales. Inflorescence terminal. Involucral bracts under the principal rays usually short, rarely 2 or 3 exceeding the inflorescence. Spikelets solitary on the stem or on the rays or rarely clustered, pale or dark brown or almost white, never black.

The genus extends all round the world, but chiefly in tropical or subtropical regions, and a larger proportion is Australian than in the case of *Scirpus* and *Heleocharis*. Of the fifty-six Australian species, thirty-nine are either really endemic or have not yet been identified with extra-Australian ones, three or four of them being however very closely allied to corresponding Asiatic species, sixteen are tropical Asiatic species, the majority of which extend into Africa, and seven of them are also in America, the remaining one species is also in New Zealand, and, perhaps, also in South Africa. Some three or four of the endemic species are as yet known by so few specimens that they may require further confirmation.

SECT. I. **Heleocharoides**.—Spikelet solitary, terminal. Glumes imbricate all round.

Nut biconvex, with transverse raised lines or wrinkles.

Style-branches 2 or rarely 3.

Spikelet erect, usually whitish.

One or two lower glumes empty.

Stems leafless but often intermixed with a very few leaves. Style-branches 2.

Stamen 1. Style glabrous 1. *F. acicularis*.

Stamens 3. Style ciliate 2. *F. acuminata*.

Leaves numerous, filiform. Style-branches 3 3. *F. punctata*.

About 4 lower glumes empty, all broad and obtuse.

Stems leafless 4. *F. rhyticarya*.

Leaves filiform, not numerous 5. *F. leucostachya*.

Spikelet nodding, usually brown 6. *F. nutans*.

Nut 3-angled or biconvex, smooth striate granular or tuberculate. Style-branches 3 or sometimes 2.

Spikelet oblong, lanceolate. Style-branches 3.

Spikelet about $\frac{1}{2}$ line broad. Leaves few or none.

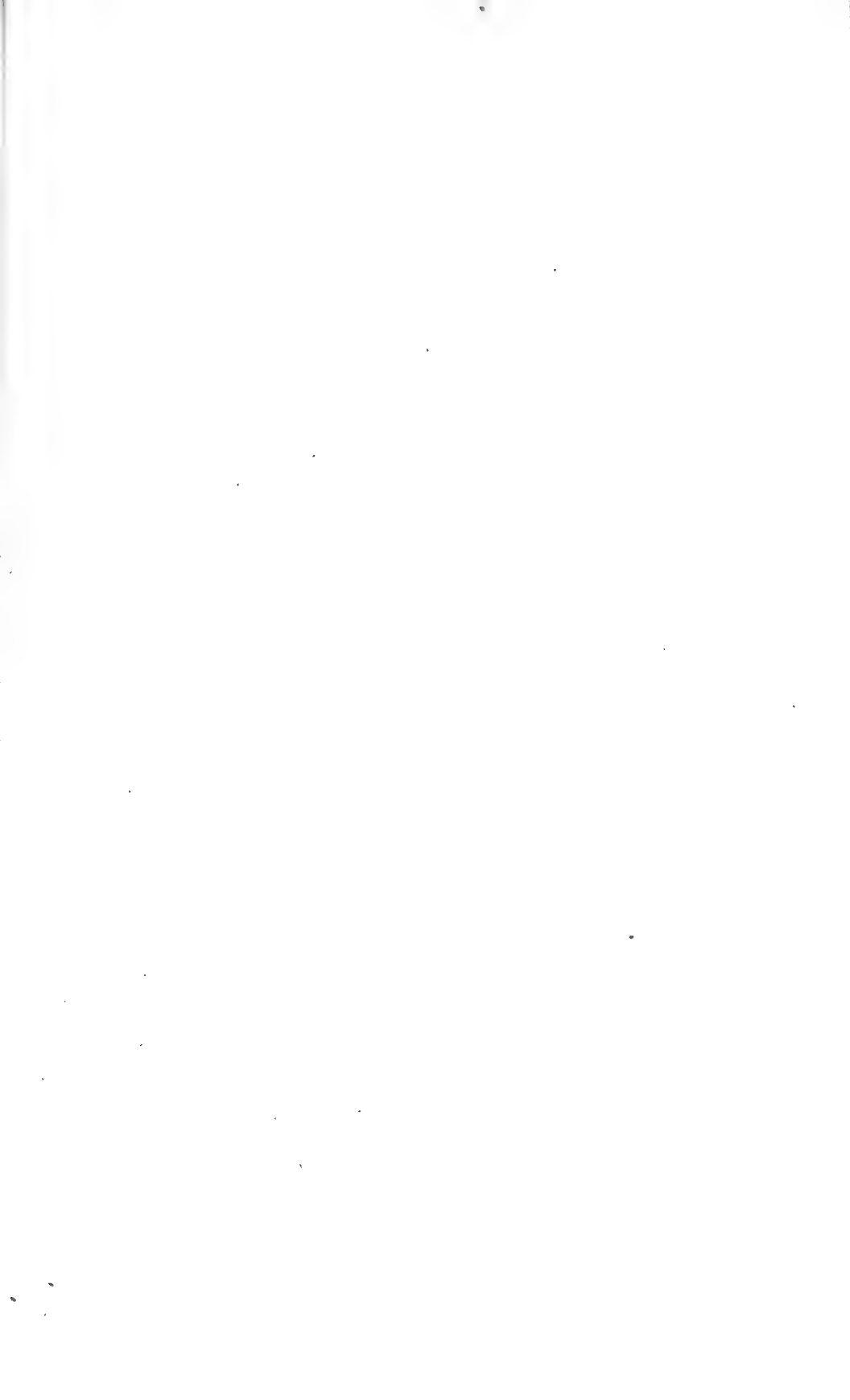
No involucral bract. Nut tuberculate 7. *F. pauciflora*.

Spikelet about $1\frac{1}{2}$ lines broad. Leaves filiform.

No involucral bract. Nut minutely tuberculate. 8. *F. cardiocarpa*.

Spikelets about 1 line broad. Leaves setaceous.

Involucral bract often as long as the spikelet 9. *F. leucocola*.





Spikelet ovate or oblong. Style-branches 2.

Spikelet 1 to $1\frac{1}{4}$ lines broad. Nut tuberculate.

Leaves numerous, filiform. Flowers all hermaphrodite 10. *F. polytrichoides*.

Stems leafless. Upper flowers female 11. *F. androgyna*.

Spikelet 2 lines broad. Nut (smooth?) rather broad. Leaves few, narrow 12. *F. subbulbosa*.

Spikelet 2 lines broad. Nut narrow-oblong, striate and cancellate. Stems leafless 13. *F. tetragona*.

Spikelet ovate, erect. Style-branches 3. Nut tuberculate. Leaves numerous.

Nut broad, 3-furrowed, on a long stipes 14. *F. trigastrocarya*.

Nut 3-ribbed, on a short stipes 15. *F. monandra*.

Spikelet globular, erect. Style-branches 3. Leaves numerous.

Spikelet white, 2 to 3 lines diameter. Nut flattened, often surrounded by a hyaline wing 16. *F. pterygosperma*.

Spikelet brown, 1 to $1\frac{1}{2}$ lines diameter 17. *F. sphaerocephala*.

Spikelet nodding, brown, ovoid or cylindrical, 3 lines diameter. Leaves long and flat. 18. *F. xyridis*.

(See also 35, *F. spiralis* and 37, *F. leptoclada*, which have sometimes solitary spikelets.)

SECT. II. **Abildgaardia**.—Spikelets solitary or few, flat with distichous glumes, or narrow and spiral in 2 or rarely 3 rows. Style-branches usually 3.

Spikelets solitary, narrow, usually spiral. Glumes long, cartilaginous or scarious.

Glumes scarious, acuminate, with erect points 19. *F. ozystachya*.

Glumes rigid, opaque, acute, closely appressed 20. *F. macrantha*.

Glumes rigid with long recurved points 21. *F. squarrulosa*.

Spikelets often several, very flat, regularly distichous or slightly spiral.

Leaves few, narrow-linear, rigid. Spikelets solitary or rarely 2 or 3, pale or nearly white 22. *F. monostachya*.

Stems tall, leafless. Spikelets 3 to 5, pale-coloured 23. *F. Brownii*.

Leaves numerous, narrow-linear. Stems 3 to 4 in.

Spikelets 4 to 6, rich brown 24. *F. Dallachyi*.

SECT. III. **Dichelostylis**.—Spikelets several usually numerous. Glumes imbricate all round. Style-branches 2. Nut biconvex.

Tufted annuals, leafy at the base. Stems under 1 ft.

Nut smooth or very minutely striate or cancellate.

Style-bulb ciliate at the base, the hairs spreading or reflexed over the nut 25. *F. velata*.

Style-bulb glabrous 26. *F. æstivalis*.

Nut with distinct longitudinal striæ or ribs and transversely cancellate.

Spikelets numerous, under 2 lines long 27. *F. dichotoma*.

Spikelets about 5 or fewer, above 2 lines long 28. *F. depauperata*.

Perennials, often above 1 ft. high.

Nut with distinct longitudinal striæ or ribs and transversely rugose. Style flat, ciliate. Leaves often numerous.

Spikelets pale coloured, about 4 lines long. Leaf-sheaths hairy 29. *F. spirastachya*.

Spikelets usually brown, about 3 lines. Leaves glabrous 30. *F. diphylla*.

Nut smooth or rugose.

Style distinctly ciliate.

- Stems leafless or with few leaves. Spikelets ovate-lanceolate, $1\frac{1}{2}$ to 2 lines broad. Nuts smooth 31. *F. ferruginea*.
 Stems leafless. Spikelets ovate or at length oblong, 1 line broad. Nut usually rugose 32. *F. denudata*.
 Style slender, nearly glabrous. Nut minute, smooth.
 Stem leafless. Spikelets lanceolate or oblong, 4 to 6 lines long 33. *F. clata*.
 Leaves filiform, often numerous. Spikelets ovate, 2 to 3 lines long 34. *F. cæspitosa*.

SECT. IV. **Trichelostylis**.—Spikelets several, usually numerous (rarely solitary in *F. spiralis* and *F. leptoclada*). Glumes imbricate all round. Style-branches 3 (except rarely in some *Glomeratæ*). Nut various.

SERIES I. **Oligostachyæ**.—Spikelets few, not clustered, occasionally solitary, above 2 lines long.

Small annuals. Leaves numerous.

Leaves setaceous. Spikelets narrow. Nuts tuberculate 35. *F. spiralis*.

Leaves linear. Spikelets ovate, aristate. Nuts granular 36. *F. subaristata*.

Stems long, leafless. Spikelets narrow. Nuts tuberculate.

Spikelets 1 or 2, erect 37. *F. leptoclada*.

Spikelets few on spreading umbel-rays 38. *F. debilis*.

SERIES II. **Polystachyæ**. Spikelets usually numerous in more or less compound umbels, not clustered on the rays.

Spikelets ovate, about 3 lines long or more.

Nuts obovoid-clavate, smooth. Leaves and involucre bracts long 39. *F. coryncarya*.

Nuts tuberculate. Leaves few. Involucre bracts short.

Style glabrous or nearly so. Nut narrow 40. *F. solidifolia*.

Style ciliate. Nut broad 41. *F. obtusangula*.

Spikelets rarely 2 lines long, globular ovate or lanceolate.

Spikelets globular, $\frac{3}{4}$ to $1\frac{1}{4}$ lines diameter. Stamen usually 1 42. *F. miliacea*.

Spikelets globular, $1\frac{1}{2}$ to 2 lines diameter. Stamens usually 3 43. *F. rara*.

Spikelets ovate or lanceolate, very numerous, under 2 lines. Stamens 1 rarely 2 or 3

Spikelets narrow-lanceolate 44. *F. microcarya*.

Spikelets ovate or oblong 45. *F. quinquangularis*.

Spikelets narrow, acute, 2- to 4-flowered (flowers more than 6 in all the preceding species) 46. *F. cyperoides*.

SERIES III. **Glomeratæ**.—Spikelets more or less clustered on the rays of the umbel, and always a central cluster of 2 or more in lieu of the single central sessile spikelet. Leaves usually numerous.

Spikelets not above 2 lines long in clusters of 2 or 3, interspersed usually with a few solitary ones.

Leaves green, flaccid, flat. Spikelets rich brown, ovoid, about 2 lines long 47. *F. furva*.

Leaves subulate, rigid, shining. Spikelets brown, 1 to $1\frac{1}{2}$ lines long 48. *F. cymosa*.

Spikelets in clusters of 3 to 10.

Leaves long, rather glaucous. Spikelets 1 to $1\frac{1}{2}$ lines long 49. *F. multifolia*.

Leaves and inflorescence silky-hairy. Spikelets 2 lines long 50. *F. sericea*.

Spikelets few but clustered, 3 to 4 lines long. Style-branches 2 51. *F. macrostachya*.

Spikelets clustered, umbellate, 4 to 5 lines long. Style
branches 3 52. *F. Neilsoni*.

SERIES IV. **Capitatae**.—Spikelets collected in a single terminal head.

Glumes obtuse, membranous. Involucral bracts concealed
under the head or rarely 1 prominent. Nut tuber-
culate 53. *F. capitata*.

Glumes mucronate. Involucral bracts spreading, 1 to 3
longer than the head. Nut smooth or nearly so . . . 54. *F. Schultzii*.

SECT. V. **Oncostylis**.—Style bulbs persistent after the style has fallen but articulate
on the nut and often at length deciduous.

Spikelets 6 to 10 in a terminal cluster. Leaf-sheaths
ciliate at the orifice 55. *F. barbata*.

Spikelets in a slightly compound or simple umbel. Leaf-
sheaths not ciliate 56. *F. capillariss*.

SECTION 1. **HELEOCHAROIDES**.—Spikelet solitary, terminal. Glumes
imbricate all round the rachis, the lowest empty glume or subtending
bract like the others or rarely produced into a point or lamina as long
as the spikelet. Style-bulb normal.

1. ***F. acicularis***, R. Br. *Prod.* 226.—Stems tufted, filiform, 3 to 6
in. high, leafless except the sheathing scales, but occasionally inter-
mixed with tufts of 2 or 3 filiform leaves. Spikelets solitary, white, erect,
slightly compressed, 3 lines long or rather more, $1\frac{1}{2}$ line broad. Glumes
imbricate all round but not numerous, oblong, almost acute, cartila-
ginous, nerveless except the 1- or 3-nerved keel, the lowest 1 or 2
glumes empty and broader. Stamen 1. Style glabrous; branches 2.
Nut white, slightly compressed, marked with transverse raised wrinkles.
—*F. australica*, Boeckl. in *Linnaea*, xxxviii. 384.

N. Australia. Arnheim Land, *F. Mueller*; Port Darwin, *Schultz*, n. 79.

Queensland. Endeavour River, *Banks and Solander*; Dunk Island, *M. Gillivray*.

F. decumbens, Boeckl. in *Flora*, 1875, 710, from Lake Elphinstone, *Amalia Dietrich*,
is probably the same species.

2. ***F. acuminata***, Vahl; *Kunth, Enum.* ii. 221, var. *setacea*.—
Stems slender, densely tufted, 3 to 6 in. high, leafless except the
sheathing scales at the base but frequently intermixed with tufts of 2
or 3 filiform leaves. Spikelet solitary, erect, narrow-oblong, 3 or
sometimes 4 lines long, scarcely above 1 line broad in this variety.
Glumes closely imbricate all round, lanceolate, acute, cartilaginous, the
keel scarcely prominent but often 3-nerved, especially on the lower
glumes, the lowest 1 or 2 glumes empty. Stamens 3. Style slightly
flattened and ciliate; branches 2. Nut obovate, biconvex, marked with
transverse raised wrinkles.—*F. acuminata*, B. *minor*, Boeckl. in *Linnaea*,
xxxvii. 4; *F. setacea*, Benth. in *Hook. Lond. Journ.* ii. 239.

Queensland. Moreton Bay, *F. Mueller, Bailey*; Fitzroy River, *O'Shanesy*;
Rockingham Bay, *Dallachy*.

The typical *F. acuminata* has larger broader spikelets, the glumes more promi-
nently keeled. It is spread over East India, Ceylon, and the Malayan Archipelago,
the Australian variety is at least in the Archipelago.

F. nuda, Bæckel. in Flora, 1875, 110, from Port Denison, *Amalia Dietrich*, with obtuse spikelets would seem to be nearer the typical form of *F. acuminata*.

3. ***F. punctata***, R. Br. *Prod.* 226.—Apparently annual, tufted, the stems 6 to 9 in. high. Leaves much shorter, numerous, narrow-linear, almost setaceous with short open sheathing bases or the inner ones with short scarious sheaths. Spikelet solitary, erect, oblong, 4 to 5 lines long, $1\frac{1}{2}$ to 2 lines diameter, pale coloured. Glumes closely imbricate all round, rather rigid, above 2 lines long, obtuse but the broad prominent keel produced into a short erect very obtuse point, the sides smooth and veinless, 1 or 2 outer ones empty with rather longer points. Stamens 2 or 3. Style flattened, ciliate in the upper part; branches 3, short. Nut broadly obovate, biconvex, whitish with a few raised transverse ridges or wrinkles and minutely pitted all over.

Queensland. East coast, R. Brown.

In the specimens examined there certainly were 3 style-branches as described by Brown, although the nut showed no trace of a third angle or rib.

4. ***F. rhyticarya***, F. Muell. *Fragm.* i. 215.—Stems from 8 or 9 in. to above 1 ft. high, leafless except short rather loose sheathing scales at the base. Spikelet solitary, erect, oblong-lanceolate or almost ovate-lanceolate, not at all or scarcely flattened, 4 to 6 lines long and 2 to $2\frac{1}{2}$ lines diameter at the base, pale-coloured or whitish. Glumes closely imbricate all round, cartilaginous, broad, obtuse or scarcely acute, often marked in the centre with 3 or 5 nerves but scarcely keeled and otherwise veinless, about 4 outer ones shorter and empty. Stamens 3. Style flattened, ciliate; branches 2. Nut obovate, but little compressed, marked with several raised transverse wrinkles.—*F. acuminata*, F. Muell. *Fragm.* viii. 274, not of Vahl.

W. Australia. Victoria River and near Providence Hill, F. Mueller.

Queensland. Burdakin River, F. Mueller; Rockingham Bay, Dallachy.

It is most probably this species that was referred to as *F. schœnoides*, Vahl, in Hook. f. Fl. Tasm. Præf. 48.

5. ***F. leucostachya***, Bæckel. in *Linnaea*, xxxviii. 385.—Stems tufted, slender, filiform, often 1 ft. high, with 1 or 2 short filiform leaves and sometimes the lower leaf long, and a few barren stems of 4 to 6 in., leafy throughout. Spikelet broadly ovoid in some specimens about 3 to 4 lines long and 2 lines diameter, narrow oblong-lanceolate, 6 to 8 lines long and $1\frac{1}{2}$ diameter in others. Glumes numerous, closely imbricate all round but very deciduous, white or tipped with brown, nerveless or showing a short central nerve at the tip, very broad and obtuse in the typical form, oblong and almost acute in the narrow form, about 4 outer ones shorter and empty. Stamens 3. Style flat, ciliate; branches 2. Nut slightly compressed, white, marked with transverse raised wrinkles and minutely pitted.

6. ***F. Australia***. Port Darwin, Schultz, n. 320, the two forms sent together. In the typical one the spikelets assume almost the shape of those of *P. pterygosperma* :

in the narrow-spiked form they resemble those of *F. punctata*, but have not the remarkably obtuse points to the glumes, and the style-branches appear to be always two only.

6. *F. nutans*, Vahl ; Kunth, Enum. ii. 221.—Stems tufted, slender, mostly above 1 ft. high, leafless except short appressed sheathing scales at the base. Spikelet solitary, terminal without any prominent subtending bract, but always more or less nodding, ovoid or ovoid-lanceolate, brown, 3 to 4 lines long, $1\frac{1}{2}$ to 2 lines broad. Glumes numerous, imbricate all round, thinly membranous almost hyaline, very broad and obtuse or the slightly prominent keel produced into a minute point, about 4 of the outer ones empty, the lowest often with a rather long point. Stamens 3. Style much dilated, ciliate ; branches 2, one of them often bifid. Nut obovate, biconvex or nearly flat on the inner face, marked with transverse raised wrinkles and tubercles when fully ripe, or perhaps sometimes nearly smooth.—Bœckel. in Linnæa, xxxvii. 5 ; R. Br. Prod. 226 ; F. Muell. Fragm. viii. 274.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Sandy Cape, *R. Brown* ; Brisbane River, *F. Mueller* ; Bailey ; Dawson River, *F. Mueller*.

N. S. Wales. New England, *C. Stuart*.

Extends over East India and the Malayan Archipelago to South China.

7. *F. pauciflora*, R. Br. Prod. 225.—Stems densely tufted, filiform, 3 to 6 in. high or rarely more. Leaves few and filiform, or all reduced to sheathing scales with scarcely any lamina. Spikelets solitary, erect, very narrow-oblong, nearly white, about 2 lines long and $1\frac{1}{2}$ line broad. Glumes few but imbricate all round and very deciduous, cartilaginous, acute, keeled, the sides veinless, the 2 outer ones empty and more acuminate with the keel more or less distinctly 3-nerved. Stamen usually 1. Style not at all or scarcely ciliate ; branches 3, rarely 2. Nut obovoid-globular, 3-ribbed, tuberculate or almost muricate.—*F. filiformis*, Kunth, Enum. ii. 221 ; Bœckel. in Linnæa, xxxvii. 23 ; *F. pumila*, Benth. in Hook. Lond. Journ. ii. 239.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown* ; near M'Adam Range, *F. Mueller* ; Regent's and Hunter's Rivers, *A. Cunningham*.

Queensland. Rockingham Bay, *Dallachy*.

Also in the Malayan Archipelago and peninsula. The plant closely resembles the var. *setacea* of *F. acuminata*, but the spikelets are narrower and the style and nuts quite different. Brown describes the style as 2-branched, Kunth says it is 3-fid or rarely 2-fid ; in the specimens I have examined I have found it 3-branched, but I believe all to belong to the same species.

8. *F. cardiocarpa*, F. Muell. Fragm. i. 194.—Stems tufted and slender but rigid, 1 ft. high or more. Leaves much shorter, subulate,

with scarious sheaths. Spikelet solitary, erect, oblong or ovate-lanceolate, 4 to 5 lines long, $1\frac{1}{2}$ to 2 lines diameter. Glumes numerous, imbricate all round, thin, almost hyaline, minutely dotted with brown, 2 outer ones empty almost ovate, the keel produced into a long point, the flowering ones narrow, 2 to 3 lines long, obtuse or the keel very slightly produced, the sides nerveless. Style slender, glabrous below the branches; branches 2, ciliate. Nut small, obovoid almost turbinate, truncate, with 3 prominent ribs and minutely tuberculate.

N. Australia. Upper Victoria River, *F. Mueller*.

9. *F. leucocolea*, Benth.—Stems densely tufted, slender, 3 to 6 in. high, hirsute at the base. Leaves mostly shorter, numerous, filiform, the persistent sheathing bases white and hyaline. Spikelet solitary, erect, oblong-lanceolate, 3 to 4 lines long, 1 line or scarcely more in diameter, pale brown. Glumes imbricate all round, lanceolate, at least 2 lines long, thinly membranous, the keel prominent and in the lower glumes produced into a rigid point, that of the outermost empty glume or subtending bract often as long as or longer than the spikelet. Stamens 3. Style scarcely flattened, glabrous; branches 3. Nut oblong, triquetrous, not seen ripe.

N. Australia. Upper Victoria River, *F. Mueller*. This species resembles in many respects the single-spikelet specimens of *F. leptoclada*, but appears to me sufficiently distinct in its foliage as well as in the glumes.

10. *F. polytrichoides*, R. Br. Prod. 226.—Stems densely tufted, slender, usually glabrous and only 2 or 3 in. high, but sometimes above 6 in. Leaves much shorter, numerous, filiform. Spikelets solitary, erect (or rarely a second lateral erect pedunculate one?), oblong, 2 to 3 lines long and scarcely above 1 line diameter, pale brown. Glumes numerous, imbricate all round, deciduous, oblong or ovate-oblong, obtuse, membranous almost hyaline, the midrib scarcely prominent except on the lower glumes where it is sometimes produced into a short point, 1 or rarely 2 outer empty glumes with longer points one sometimes as long as the spikelet. Stamens 1 or 2. Style scarcely flattened but hairy; branches 2. Nut obovate, biconvex, dark-coloured, tuberculate.—Kunth, Enum. ii. 221; *F. juncea*, Bœckel. in Linnæa, xxxvii, 4, partly, but probably not *Scirpus junceus*, Forst.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.
Queensland. Moreton Bay, *F. Mueller*.

Also in East India and the Malayan Archipelago. The Australian plant agrees very well with the Indian one, identified with it by Kunth and others, but not with Forster's species with which Bœckeler unites it, if I am right in referring to this true *F. juncea* a plant gathered by Hinds in the Marquesas Islands.

11. *F. androgyna*, R. Br. Prod. 226.—Stems densely tufted, slender, 6 to 10 in. high, leafless except the sheathing scales. Spikelet

solitary, erect, narrow-lanceolate, pale coloured, about 4 lines long and rather above 1 line diameter at the base. Glumes numerous, imbricate all round, oval-oblong, obtuse or nearly so, thinly membranous, the keel slender but prominent, the sides almost hyaline towards the margin, 2 or 3 of the lower ones empty. Stamens in all the lower flowers 2 or 3, in the upper ones deficient or here and there a short filament. Style slender, slightly ciliate; branches 2, very long in the upper female flowers. Nut obovate, biconvex, white, tuberculate.

N. Australia. North coast, probably Arnhem Land, *R. Brown*.

12. **F. subbulbosa**, *Benth.*—Stems from a thick horizontal rhizome numerous, thickened and bulb-like at the base, slender, often $1\frac{1}{2}$ ft. long. Leaves few narrow and short or almost reduced to sheathing scales. Spikelet solitary, erect, ovoid or oblong, about 4 lines long and 2 lines broad when full grown, light brown. Glumes numerous, imbricate all round, broadly ovate, obtuse or the keel slightly prominent, thin almost membranous, 3 or 4 outer ones empty shorter and sometimes more pointed. Stamens 3. Style flat, ciliate; branches 2. Nut obovate or oblong, biconvex, smooth in the specimens seen but not yet fully ripe.

Queensland, *Armitage*; Rockingham Bay, *Dallachy*.

13. **F. tetragona**, *R. Br. Prod.* 226.—Stems 9 in. to above 1 ft. high, slender, often thickened into a bulb at the base, leafless except short loose sheathing scales at the base. Spikelets solitary, erect, ovoid, obtuse, 3 to 4 lines long and 2 lines diameter, the rachis at length sometimes longer but denuded at the base, the lower glumes having fallen away. Glumes numerous, closely imbricate all round, oblong or rather broad, very obtuse, very finely striate but otherwise nerveless, thinly cartilaginous, 4 to 6 of the lower ones empty. Stamens 3. Style flattened, ciliate; branches 2 or rarely 3. Nut narrow-oblong, scarcely flattened, longitudinally striate and transversely cancellate.—*F. Muell. Fragm.* i. 194, viii. 274; *F. cylindrocarpa*, *Kunth, Enum.* ii. 222; *Bœckel. in Linnæa*, xxxvii. 7; *Trichelostylis xyroides*, *Arn.*; *Hook. f. Fl. Tasm. Præf.* 48.

N. Australia. Islands of the Gulf of Carpentaria, *F. Brown*; Providence Hill and Depot Creek, Upper Victoria River, *F. Mueller*.

Spreads over East India, Ceylon, and the Malayan Archipelago.

14. **F. trigastrocarya**, *F. Muell. Fragm.* i. 194.—Densely tufted, apparently annual. Stems filiform, 4 to 8 in. high, minutely pubescent. Leaves much shorter, filiform, with short open sheaths. Spikelet solitary, erect, ovoid or at length oblong-lanceolate, pale-brown, 3 to 4 lines long, nearly $1\frac{1}{2}$ lines diameter. Glumes numerous, imbricate all round, membranous almost hyaline and spotted with brown, ovate or oblong, obtuse, nerveless except the midrib or keel, often produced

in the lower ones into a short point, the lowest 1 or 2 glumes or involueral bracts subulate, but shorter than the spikelet, and sometimes with scarious margins at the base, the lower part of the rhachis often denuded, the glumes and nuts being very deciduous. Stamens 3. Style scarcely flattened, glabrous; branches 3. Nut marked with 3 deep furrows so as to be almost 3-lobed, tuberculate, tapering at the base into a smooth stipes.

N. Australia. Depot Creek, Upper Victoria River, *F. Mueller*.

15. ***F. monandra*, *F. Muell. Fragm.* i. 195.**—Densely tufted and apparently annual. Stems filiform, 4 to 8 in. high, glabrous or here and there minutely pubescent. Leaves much shorter, numerous, filiform. Spikelet solitary, erect, ovoid or oblong, brown, 3 to 4 lines long, about 2 lines diameter. Glumes numerous, imbricate all round, very deciduous, ovate-oblong, obtuse, membranous almost hyaline, the midrib or keel slightly prominent, 2 lower empty ones narrow with a short subulate point but deciduous like the others. Stamen 1. Style slender, glabrous; branches 3 or in some flowers abnormally 4. Nut obovoid, prominently 3-ribbed, tuberculate, tapering into a short stipes.

N. Australia. Depot Creek, Upper Victoria River, *F. Mueller*.

16. ***F. pterygosperma*, *R.Br. Prod.* 226.**—Stems tufted, slender but rigid, 6 in. to 1 ft. high. Leaves much shorter, with short broad open sheaths or the inner one with a longer closed sheath. Spikelet solitary, erect, almost globular or at length conical, 2 to 3 lines diameter. Glumes numerous, closely imbricate all round, cartilaginous, nerveless, white or the inner ones tipped with brown, all very obtuse and broad, especially the outer ones, of which 4 to 6 are empty and rather larger than the flowering ones. Stamens 2 or 3. Style much flattened but glabrous; branches 3, short. Nut broadly obovate, truncate, stipitate, more or less flattened, with 3 prominent ribs, the two lateral ones often but not in all specimens fringed with a broad hyaline wing, marked with radiating striæ, the dorsal rib never fringed.—Bœckel. in *Linnæa*, xxxviii. 388.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; South Goulburn Island, *A. Cunningham*; Sturt's Creek, Upper Victoria River, *F. Mueller*; Arnhem Land, north coast, *M'Kinlay*; Port Darwin, *Schultz*, n. 790, 812.

17. ***F. sphærocephala*, *Benth.***—Stems densely tufted, filiform, 3 to 6 in. high. Leaves much shorter, numerous, filiform, glabrous or minutely pubescent, with short open sheaths. Spikelet solitary, erect, globular and 1 to $1\frac{1}{2}$ lines diameter, or at length ovoid and 2 lines long, brown. Glumes numerous, closely imbricate all round, broadly obovate or orbicular, obtuse, membranous almost hyaline, shortly ciliate, the midrib or keel slightly prominent and in the 1 or 2 outer empty glumes produced into a short point. Stamen 1. Style hairy

but scarcely flattened; branches 3. Nut not seen ripe but showing 3 prominent ribs as in *F. monandra*.

N. Australia. Victoria River *F. Mueller*; Camden Harbour, *Martin*.

Queensland. Sunday Island, near Cape York, *A. Cunningham*.

18. ***F. xyridis*, R. Br. Prod. 226.**—Stems slender but rigid, 1 to 1½ ft. high, pubescent at the base with short spreading hairs. Leaves rather numerous at the base of the stem and some half as long, flat and grass-like, shortly ciliate, the outer ones with short open sheaths, the innermost with a long close sheath. Spikelets solitary, nodding but terminal, ovoid or shortly cylindrical, very obtuse, 4 to 5 lines long, nearly 3 lines diameter, of a rich brown. Glumes very numerous and closely imbricate all round, obovate or orbicular, very obtuse, thinly membranous almost hyaline, the central nerve not prominent in the typical form and otherwise nerveless, the margins sometimes minutely pubescent, the 1 or 2 outer ones empty but nearly similar. Stamens 3 (or sometimes 2?). Style flattened but glabrous; branches 3. Nut oblong, triquetrous, smooth but not seen quite ripe.—Bœckel. in *Linnaea*, xxxviii. 389; *F. Muell. Fragm.* viii. 274.

N. Australia. Islands and mainland of the Gulf of Carpentaria, *R. Brown*; Arnhem Land, N. coast, *M'Kinlay*; Port Darwin, *Schultz*, n. 16, 177, 813; between Norman and Gilbert Rivers, *Gulliver*.

Var. *rigidula*. Glumes with a prominent rigid midrib and the spikelet apparently larger, but not fully out in the only specimen seen.—Fitzroy Island, *Walter*.

SECTION II. ABILDGAARDIA.—Spikelets erect, solitary or few, flat with distichous glumes or narrow and spiral with 2 or 3 rows of glumes. Style-bulb normal; branches usually 3.

19. ***F. oxystachya*, F. Muell. Fragm. i. 195.**—Stems densely tufted, slender, smooth, 4 in. to near 1 ft. high. Leaves much shorter, few and filiform, the sheathing scales at the base of the stem often scarious. Spikelet solitary, erect, oblong or narrow-lanceolate, slightly flattened, 5 to 6 lines long, 1 to 1½ lines broad. Glumes irregularly spiral or almost distichous, rigid but much thinner than in *F. monostachya* and almost scarious, lanceolate, acuminate or acute, the keel prominent and green, the sides pale brown or whitish and nerveless, the flowering ones nearly 3 lines long, 3 or 4 outer empty ones gradually shorter and broader, the lowest very small. Stamens 2 or 3. Style very shortly pubescent; branches 3. Nut obovoid, stipitate, 3-ribbed, prominently tuberculate.

N. Australia. Upper Victoria River, *F. Mueller*.

20. ***F. macrantha*, Bœckel. in Linnaea, xxxviii. 388.**—Stems tufted, 1 to 1½ ft. high, slender but rigid and scabrous. Leaves very much shorter, narrow linear or subulate. Spikelet solitary, erect, oblong-

linear, scarcely flattened, about $\frac{1}{2}$ in. long and $1\frac{1}{2}$ lines broad. Glumes not very numerous, imbricate all round or irregularly spiral, scarcely distichous, cartilaginous, the keel prominent and produced into a minute erect point, the sides scarcely striate, the flowering ones scarcely 3 lines long, about 4 empty and gradually shorter and broader. Stamens 2 or 3. Style dilated, ciliate; branches 3. Nut obovoid, stipitate, 3-ribbed but somewhat compressed, tuberculate-punctate.

N. Australia. Victoria River, *F. Mueller*; Port Darwin, *Schultz*, n. 789, 814.

21. *F. squarrulosa*, *F. Muell. Fragm.* i. 216.—Stems tufted, 1 to $1\frac{1}{2}$ ft. high, slender but rigid, leafless except the short erect subulate points of the sheathing scales, but intermixed with a few long narrow radical leaves. Spikelet solitary, erect, narrow-oblong, scarcely flattened, 6 to 9 lines long, scarcely 2 lines broad. Glumes not numerous, almost distichous or irregularly spiral, cartilaginous, the keel prominent and tapering into a spreading point, the sides nerveless or minutely striate, the longer flowering ones about 4 lines long, about 4 outer empty ones gradually shorter and broader. Stamens 3. Style scarcely dilated, minutely ciliate; branches 3. Nut stipitate, ovoid, obtuse, slightly 3-ribbed, prominently tuberculate when quite ripe.—*Abildgaardia schœnoides*, R. Br. Prod. 229.

N. Australia. Gulf of Carpentaria, *R. Brown*; Victoria River, *F. Mueller*.

22. *F. monostachya*, *Hassk. Pl. Jav. Rar.* 61.—Rhizome short, horizontal. Stems often thickened at the base, otherwise slender, from under 1 ft. to $1\frac{1}{2}$ ft. high. Leaves shorter, very narrow. Spikelet solitary, erect, or rarely accompanied by a second or even a third pedicellate one, ovate or ovate-lanceolate, more or less flattened, pale or nearly white, 4 to 7 lines long, 2 to 3 lines broad. Glumes distichous or at length more or less spiral, cartilaginous, ovate, mostly 2 lines long, the keel prominent and produced into a short point, 1 or 2 lower empty ones narrow and more pointed. Stamens 3. Style slightly dilated, ciliate; branches 3 or 2. Nut rather large, obovoid or globular, obtusely 3-angled, tuberculate or almost muricate.—*Abildgaardia monostachya*, Vahl; Kunth, Enum. ii. 247; Bœckel. in Linnæa, xxxvii. 53; R. Br. Prod. 229; *F. Muell. Fragm.* viii. 272.

Queensland. East Coast, *R. Brown*; Port Curtis, *M'Gillivray*; Burnet River, *F. Mueller*; Rockhampton, *O'Shanesy*, *Thozet*; Herbert Creek, *Bowman*; Brisbane River, Moreton Bay, *F. Mueller*, *Leichhardt*, *C. Stuart*.

N. S. Wales. Paramatta, *Woolfs*; New England, *C. Stuart*; Macleay River, *Beckler*.

The species extends over the tropical regions of the New and the Old World. *F. Mueller*, l. c., unites with it the three preceding species which, however, appear to me to be constantly distinct in the shape and structure of their spikelets.

23. *F. Brownii*, *Benth.*—Stems leafless except the sheathing scales at the base, slender, 1 ft. high or rather more. Spikelets 2 to 5, the central one sessile the others pedunculate. Involucral bract subulate not always present but sometimes longer than the inflores-

cence. Spikelets erect, ovate-lanceolate, very flat, pale brown, 4 to 5 lines long, $1\frac{1}{2}$ to 2 lines broad, 3- to 12-flowered. Glumes regularly distichous, acute with a short fine point, keeled, the sides rigidly membranous, 1 or 2 outer empty ones shorter with longer points. Style-branches 3. Nut not seen.—*Abildgaardia vaginata*, R. Br. Prod. 229.

N. Australia. Islands off the N. coast of Arnhem Land, *R. Brown*.

24. F. Dallachyi, *F. Muell. Herb.*—A small tufted plant, apparently annual. Stems slender, 3 to 4 in. high. Leaves much shorter, rather numerous, narrow-linear but flat. Umbel simple, of 3 or 4 short filiform rays besides the sessile spikelet, the peduncles or rays shortly hirsute. Involucral bracts few and short. Spikelets very flat, lanceolate, acute, of a rich brown, about 3 lines long, 1 line broad, 8- to 12-flowered. Glumes very regularly distichous, navicular, lanceolate, acute, prominently keeled, the sides nerveless. Stamens 2 or 3. Style slender, shortly bulbous at the base, glabrous; branches 3. Nut obovoid, 3-ribbed, whitish, tuberculate.—*Abildgaardia fimbristyloides*, *F. Muell. Fragm.* viii. 273.

Queensland. Rockingham Bay, *Dallachy*. Very near the Indian *Abildgaardia fusca*, *Nees (A. fulvescens, Thw.)*, of which it may be a variety, differing in its small size, flatter and more regularly distichous spikelets; the specimens are very few and not satisfactory.

SECTION III. DICHELOSTYLIS.—Spikelets several, usually numerous, but not clustered. Glumes imbricate all round the rhachis. Style-bulb normal; branches 2. Nut biconvex, smooth or rugose, not tuberculate.

25. F. velata, *R. Br. Prod.* 227.—Small densely tufted and apparently annual. Stems 3 to 6 in. high. Leaves much shorter, linear or setaceous, usually pubescent at least on the sheaths, rarely entirely glabrous. Umbel usually compound and rather compact, with slender rays and pedicels. Involucral bracts setaceous, much shorter than the inflorescence, or rarely 1 to 2 in. long. Spikelets solitary on the rays or pedicels, at first ovate-oblong and about 2 lines long, but often lengthening when old, scarcely 1 line broad, pale brown, glabrous or pubescent. Glumes rather closely imbricate all round, the very prominent keel produced into a short erect point. Stamen 1. Style slightly pubescent; the dilated base fringed with spreading hairs often long and closely reflexed over the ovary and nut; branches 2. Nut obovoid, usually brown, biconvex, minutely striate or cancellate.—*Hook. f. Fl. N. Zel.* i. 272; *F. dichotoma*, *Hook. f. Handb. N. Zeal. Fl.* 303, not of *Vahl*; *F. propinqua*, *R. Br. Prod.* 227.

N. Australia. Arnhem Land, *F. Mueller*, including specimens from South Alligator River, with much shorter hairs at the base of the style.

Queensland, *Mitchell*; Wide Bay, *Bidwill*.

N. S. Wales. Nepean and Paterson Rivers, *R. Brown*; Severn River, *Leichhardt*;

Clarence River, *Wileor*; Richmond River, *Mrs. Hodgkinson*; Hawkesbury, *Woolfs*; Darling River, *Dallachy* and others, Barcoo River, *Howitt's Expedition*.
Victoria. Avon River, *F. Mueller*.

Also in New Zealand and a closely allied plant in S. Africa. *F. Mueller*, *Fragm.* ix. 11, unites the Australian plant with the East Indian *F. squarrosa*, Vahl, which appears to me to be constantly distinct in the 3-nerved glumes tapering into a long recurved point, giving the spikelet a peculiar squarrose aspect. Bœckeler in *Linnaea*, xxxvii. 13, seems to have inadvertently referred Mitchell's specimens to a variety of *F. dichotoma*.

26. *F. æstivalis*, Vahl; Kunth, Enum. ii. 226.—Densely tufted and probably annual. Stems slender, 3 to 6 in. high or when luxuriant 8 or 9 in. Leaves much shorter, rather numerous, filiform, the sheaths and often the whole leaf pubescent or hirsute. Umbel nearly simple or compound, with filiform rays and pedicels. Involucral bracts filiform, slightly dilated at the base, 1 or 2 longer than the inflorescence or all shorter. Spikelets solitary on the rays or pedicels, of a light brown, at first ovate and only 1 line long, at length oblong and sometimes 2 lines long, under 1 line broad. Glumes loosely imbricate all round, membranous, the keel prominent often ciliate and produced into a short point, 1 or 2 outer ones empty. Stamen 1 (rarely 2?). Style glabrous or slightly ciliate near the end; branches 2. Nut obovate, biconvex, smooth or under a strong lens minutely reticulate. —Bœckel. in *Linnaea*, xxxvii. 11; *F. Muell. Fragm.* ix. 11; *F. pallescens*, Nees; Hook. f. *Fl. Tasm. Præf.* 48.

N. Australia. Near M'Adam Range, *F. Mueller*.

Queensland. Cape York, *M'Gillivray*; Rockingham Bay, *Dallachy*; Rockhampton and neighbourhood, *Bowman*, *O'Shanesy*.

N. S. Wales. New England, *C. Stuart*.

Victoria. Ovens and Goulburn Rivers, *F. Mueller*.

Var. *macrostachya*. Spikelets ovate or ovate-lanceolate, 2 to 3 lines long, 1½ lines broad. —Rockingham Bay, *Dallachy*; Russell River, *Herb. F. Mueller*.

The species ranges over tropical and subtropical Asia and the same or a very closely allied one is in America.

27. *F. dichotoma*, Vahl; Kunth, Enum. ii. 225.—Densely tufted and apparently annual. Stems from a few inches to nearly 1 ft. high. Leaves shorter, rather numerous, very narrow linear but flat, quite glabrous or the sheaths slightly ciliate. Umbel nearly simple or compound but not usually large, the longest rays ½ to 1 in. Involucral bracts narrow-linear, 2 or 3 longer than the inflorescence. Spikelets ovate, from 1 to 1½ lines long. Glumes imbricate all round but not very numerous, ovate, membranous, with a very prominent keel produced into a short erect point. Stamen 1. Style flattened, ciliate but the base glabrous; branches 2. Nut broadly obovate, biconvex, with 10 to 12 prominent longitudinal striæ and transversely cancellate. —Bœckel. in *Linnaea*, xxxvii. 12; *Reichb. Ic. Fl. Germ. t.* 315; *F. Muell. Fragm.* ix. 10; *F. parviflora*, R. Br. *Prod.* 227.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Tarampa Creek, *F. Mueller*; Rockingham Bay, *Dallachy*; Herbert's Creek, *Bowman*; Moreton Bay, *C. Stuart*.

N. S. Wales. Richmond River, *C. Moore*; Glendon, *Leichhardt*.

Extends over the warmer regions of both the New and the Old World.

28. **F. depauperata**, *R. Br. Prod.* 227.—A small slender annual. Stems 4 to 6 in. high. Leaves numerous, very narrow but flat, the outer ones short and setaceous, the sheaths with rather long hairs. Umbel simple, of 3 or 4 slender rays $\frac{1}{4}$ to $\frac{1}{2}$ in. long or reduced to a single spikelet. Involucral bract long, slender and erect with sometimes a second shorter one. Spikelets pale brown, ovate or ovate-lanceolate, 2 lines long or rather more. Glumes imbricate all round but not very numerous, broadly ovate, acute, membranous, the keel slightly prominent, the sides nerveless. Stamen 1. Style ciliate except at the base; branches 2. Nut broadly obovate, biconvex, marked with raised striæ and transversely cancellate.

N. Australia. Arnhem Land, north coast, *R. Brown*.

29. **F. spirostachya**, *F. Muell. Herb.*—Tufted and apparently perennial. Stems 1 to $1\frac{1}{2}$ ft. high, rather slender, striate. Leaves much shorter, narrow but flat, the long sheaths usually hairy. Umbel compound, the rays numerous and slender, but the longest only 1 to $1\frac{1}{2}$ in. long. Involucral bracts very narrow, 1 or 2 longer than the inflorescence. Spikelets ovate or ovate-lanceolate, pale brown, 3 to 6 lines long, about 2 lines broad. Glumes numerous, imbricate all round but the spiral arrangement usually very conspicuous, broad, thin but rather rigid and opaque, obtuse or very shortly mucronate, sometimes minutely powdery-pubescent, the keel prominent towards the top, the sides smooth or minutely striate. Stamens 3. Style flat, ciliate; branches 2. Nut obovate, biconvex, with rather thickened margins, longitudinally striate and transversely cancellate.

N. Australia. Upper Victoria River, *F. Mueller*. Allied to the East Indian *P. schænoides*, Vahl, which, however, has only 1 to 3 spikelets to each stem.

30. **F. diphylla**, *Vahl, Enum.* ii. 289.—Stems from a perennial rhizome tufted, rather slender, often compressed, $\frac{3}{4}$ to $1\frac{1}{2}$ ft. high, usually scabrous under the inflorescence. Leaves narrow-linear, from almost subulate to $1\frac{1}{2}$ lines broad, rarely as long as the stem, mostly radical with short open sheaths. Umbel more or less compound or almost simple, loose with the longer rays 1 to 3 in., or crowded. Involucral bracts leafy, 1 or 2 often exceeding the inflorescence. Spikelets few or numerous, ovoid or oblong, usually brown and about 3 lines long and $1\frac{1}{2}$ lines broad. Glumes closely imbricate all round, broad, rather rigid, shortly mucronate, the keel 1- or 3-nerved, the sides smooth. Stamen in the typical form 1, in some varieties 3. Style flattened, ciliate; branches 2. Nut obovate, much compressed but biconvex, whitish, distinctly striate and cancellate.—*F. variabilis*, *R. Br.*

Prod. 228; *F. communis*, Kunth, Enum. ii. 234; *F. Muell.* Fragm. ix. 10; *F. polymorpha*, Bœckel. in Linnæa, xxxvii. 14; *F. elongata* and *F. stricta*, R. Br. Prod. 228; *F. gracilis*, *F. tristachya* and *F. obtusifolia*. Nees in Sieb. Agrostoth. n. 2, 114, 117 (the two latter numbers West Indian).

N. Australia. Arnhem Land and Gulf of Carpentaria, *R. Brown*; Port Darwin, *Schultz*, n. 34, 178; Upper Victoria River, *F. Mueller*.

Queensland. Port Curtis and Percy Island, *McGillivray*; Rockingham Bay, *Dallachy*; Rockhampton and neighbourhood, *Thozet*, *Bowman* and others; Moreton Bay, *F. Mueller*, *Leichhardt* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolfs* and others; New England, *C. Stuart*.

Var. *gracilis*. Leaves very narrow, glumes more membranous and paler coloured than in the ordinary form. Stamens usually 3.—*F. gracilis*, R. Br. Prod. 227; *F. Royeniana*, Nees (partly), Hook. f. Fl. Tasm. Pref. 48.—Keppel Bay, *R. Brown*; Darling River, *Dallachy*; Central Australia, *Giles*. Some specimens from the western interior of N. S. Wales appear intermediate between this and the typical form.

The species is common in the warmer regions both of the New and the Old World, extending into North America. The South European *F. annua*, Roem. et Schult., united with it by Bœckeler, may however be specifically distinct.

31. ***F. ferruginea*, Vahl; Kunth, Enum. ii. 236.**—Perennial, glabrous and smooth. Stems rigid, striate, often slightly compressed, 1 to 2 ft. high. Leaves few, the narrow-linear lamina often erect and shorter than the brown membranous sheath. Umbel simple or slightly compound. Involucral bracts few, either all very short or 1 or 2 slightly exceeding the inflorescence. Spikelets few, rarely reduced to 1 or 2 or increased to about 12, dark or light brown, always rather large but varying in size from 4 lines long and $1\frac{1}{2}$ lines broad to above $\frac{1}{2}$ in. long and fully 2 lines broad. Glumes numerous, closely imbricate all round, broadly ovate or almost orbicular, membranous with a rather fine but prominent keel often produced into a short point, the sides nerveless or faintly striate, often minutely hoary-pubescent. Stamens 3. Style ciliate; branches 2. Nut obovate, much compressed but biconvex, usually with a thickened margin, quite smooth or under a strong lens very minutely striate and cancellate.—Bœckel. in Linnæa, xxxvii. 16; *F. Muell.* Fragm. ix. 10; *F. brevifolia*, R. Br. Prod. 228.

N. Australia. Near Providence Hill, *F. Mueller*.

Queensland. Rockingham Bay, *Dallachy*; Rockhampton, *Thozet* and others; Brisbane River, Moreton Bay, *F. Mueller*, *Leichhardt*.

N. S. Wales. Botany Bay, *Banks* and *Solander*; Richmond River, *Mrs. Hodgkinson*; near Mount Murchison, *Bonney*.

W. Australia. Murchison River, *Oldfield*.

Var. *foliata*. Leaves long though few and often only one, the sheaths often pubescent. Spikelets large.—*F. arvensis*, Vahl; Kunth, Enum. ii. 237; *F. tristachya*, R. Br. Prod. 226; *F. paucispicata*, *F. Muell.* Fragm. i. 197. Gulf of Carpentaria, *R. Brown*; Upper Victoria River, *F. Mueller*; Bowen Downs, *Birch*; Springsure, *Wuth*.

The species is dispersed over the warmer regions of the New and the Old World.

32. *F. denudata*, R. Br. Prod. 227.—Perennial and glabrous. Stems densely tufted, slender but rigid, 6 in. to nearly 1 ft. high, leafless except short sheathing scales or very rarely intermixed with a very few long setaceous leaves. Umbels simple, of 3 to 6 spikelets or one of the lateral rays bearing 2 spikelets distant from each other, the branches or rays as well as the spikelets erect. Involucral bracts short and glumelike or rarely produced into a short point. Spikelets brown, at first ovate-oblong and about 2 lines long, at length nearly cylindrical and 3 to 5 lines, scarcely 1 line diameter. Glumes numerous, imbricate all round, ovate or oblong, obtuse or shortly mucronate, the keel very prominent, the sides membranous. Stamens 2 or 3. Style flattened, ciliate; branches 2. Nut minute, obovate, biconvex, smooth or under a strong lens slightly rugose.—F. Muell. Fragm. ix. 9.

N. Australia. Arnhem Land, N. coast, *R. Brown*; Victoria River, *F. Mueller*; between Norman and Gilbert Rivers, *Gulliver*.

33. *F. elata*, R. Br. Prod. 227.—Perennial, glabrous. Stems slender, 1 to 1½ ft. high, leafless except sheathing scales. Umbels slightly compound, the rays not numerous, spreading, almost filiform, the longest 1 to 2 in. long. Involucral bracts small and glume-like. Spikelets ovate-lanceolate or at length oblong, 3 to 4 or even 5 lines long, pale brown. Glumes imbricate all round, ovate, obtuse, membranous, the keel not very prominent but often 3-nerved. Stamens 3. Style slender, shortly ciliate; branches 2. Nut minute, obovoid-globular, smooth, dark-coloured.

N. Australia. Arnhem Land, North Coast, *R. Brown*.

34. *F. cæspitosa*, R. Br. Prod. 228.—Perennial. Stems 6 to 10 in. high, slender. Leaves very much shorter, rather numerous, setaceous. Umbel simple or slightly compound, the rays slender, ½ to ¾ in. long. Involucral bracts very short and glume-like. Spikelets ovate or at length ovate-oblong, 2 to 3 lines long, nearly 1½ lines broad. Glumes numerous, closely imbricate all round, membranous, ovate, obtuse or scarcely mucronate, the keel very slightly prominent, with a lateral nerve on each side in the lower glumes. Stamens 2 or 3. Style slender, scarcely ciliate; branches 2. Nut minute, biconvex, pale or dark coloured, smooth or under a strong lens minutely striate and cancellate.—*F. brachylæna*, F. Muell. Fragm. i. 199.

N. Australia. Arnhem Land and Gulf of Carpentaria, *R. Brown*; Upper Victoria River, *F. Mueller*; Sweers Island, *Henne*.

Queensland. Herbert River, *Armitage*.

F. Mueller, Fragm. ix. 9, unites this with *F. denudata* which it resembles in many respects, but the rather numerous setaceous leaves, the more numerous and differently shaped spikelets, and some other characters appear sufficiently to distinguish it.

SECTION IV. TRICHELOSTYLIS.—Spikelets few or many in a simple or compound umbel cluster or head rarely (in *F. spiralis* and *F. leptostylis*).

clada) reduced to a single spikelet. Glumes imbricate all round the rachis. Style-bulb normal; branches 3 (except rarely in the *Glomeratæ*). Nut various.

SERIES I. OLIGOSTACHYÆ.—Spikelets few, occasionally solitary.

35. **F. spiralis**, *R. Br. Prod.* 226.—Apparently annual. Stems filiform, 2 to 3 in. high. Leaves as long, numerous, setaceous. Spikelets either solitary and erect or 2 together, the second on a short reflexed pedicel. Involucral bract short. Spikelets pale brown, lanceolate, acute, 4 to 5 lines long, nearly $1\frac{1}{2}$ lines diameter. Glumes numerous, closely imbricate all round but the spiral arrangement often very distinct, obtuse, concave, thin, faintly striate or smooth, scarcely keeled. Stamens 2 or 3. Style glabrous or minutely ciliate; branches 3. Nut ovoid-oblong, tuberculate, finely 3-ribbed.

N. Australia. Arnhem Bay, *R. Brown*.

36. **F. subaristata**, *Benth.*—Apparently annual, glabrous. Stems slender, tufted, 3 to 4 in. high. Leaves much shorter, numerous, narrow-linear, spreading. Umbel simple, of few spreading rays on pedicels not exceeding $\frac{1}{2}$ in. Involucral bracts linear-subulate, 1 often as long as the rays. Spikelets pale-coloured, ovate-lanceolate, 2 to 3 lines long. Glumes loosely imbricate all round, ovate or ovate-lanceolate, the keel very prominent and produced into a spreading point, often rather long and awn-like in the lower ones, shorter on the uppermost ones, the sides membranous, brown and sometimes with white scarious margins. Stamens 2 or 3. Style slender, glabrous; branches 3. Nut broadly obovoid, almost obcordate, very prominently 3-ribbed, granular-tuberculate, the granules usually in regular vertical rows.

N. Australia. Sturt's Creek, *F. Mueller*.

37. **F. leptoclada**, *Benth.*—Perennial and glabrous. Stems densely tufted, filiform, 6 in. to 1 ft. long, leafless except the sheathing scales which are mostly scarious especially in the upper part. Spikelets either solitary or with 1 rarely 2 additional pedicellate ones, lanceolate, pale brown, 4 to 6 lines long, $1\frac{1}{2}$ to 2 lines diameter. Glumes imbricate all round, lanceolate or ovate-lanceolate, acuminate-acute, about 2 lines long, very thinly membranous almost scarious and hyaline on the sides, the keel prominent and sometimes a faint nerve on each side, about 2 lower ones shorter and empty and often the uppermost empty or with imperfect flowers. Stamens 3. Style slender, nearly glabrous, more ciliate at the base; branches 3. Nut obovoid, 3-ribbed, white, tuberculate.

Queensland. Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*. The spikelets are something like those of *F. androgyna*, but usually 2 or 3, the glumes acuminate and the style branches 3.

38. **F. debilis**, *F. Muell. Fragm. i.* 198.—Stems densely tufted, weak, almost filiform, 1 ft. long or more, leafless except rather loose sheathing scales sometimes produced into short erect laminæ. Umbel simple or slightly compound, of few rays, all short or the longest 1 in. long. Involucral bracts very short. Spikelets linear-lanceolate, pale brown, 3 to 5 lines long, about 1 line broad. Glumes not numerous, loosely imbricate all round, lanceolate, acuminate, with rather long fine erect or slightly spreading points, the keel prominent and often minutely ciliate, the sides scarious. Stamens usually 2. Style nearly glabrous; branches 3. Nut nearly globular, obscurely 3-angled, dark-coloured, coarsely tuberculate.

N. Australia. Depot Creek, Upper Victoria River, *F. Mueller*.

SERIES II. POLYSTACHYÆ.—Spikelets usually numerous, in more or less compound umbels, not clustered on the rays.

39. **F. corynocarya**, *F. Muell. Fragm. i.* 197.—Apparently perennial, glabrous. Stems angular or flattened, about 2 ft. high. Leaves almost distichous, very narrow, 2 or 3 as long as the stem or longer. Umbel compound, the longest rays 2 to 3 in. long. Involucral bracts very narrow, dilated at the base, 2 or 3 of them longer than the inflorescence and those of the partial umbels often rather long. Spikelets broadly ovate, pale brown, about 3 lines long and 2 lines broad. Glumes numerous, but rather loosely imbricate all round, broad, rather acute, rigid and obscurely 3-nerved in the centre, the broad sides thinly scarious and ciliate. Stamens 3. Style slender, minutely ciliate; branches 3. Nut obovoid-clavate, contracted into a long stipes, very prominently 3-ribbed, perfectly smooth.

N. Australia. Depot Creek, Upper Victoria River, *F. Mueller*, a single specimen in his herb.

40. **F. solidifolia**, *F. Muell. Fragm. i.* 198.—Glabrous and perhaps annual though 1 to $1\frac{1}{2}$ ft. high. Leaves few, narrow, erect, flat or nearly terete, the longest sometimes as long as the stem. Umbels slightly compound, of few rays, the longest 1 to $1\frac{1}{2}$ in. long. Involucral bracts narrow, shorter than the rays or 1 as long. Spikelets 1 to 3 on each ray, pale brown, broadly ovate and about 3 lines long, but the rhachis lengthening as the lower glumes fall away. Glumes numerous, imbricate all round but very concave and distinct, obtuse, the keel prominent but not thick, with usually a nerve on each side. Stamens 3. Style nearly glabrous; branches 3. Nut narrow-obovoid, clavate, 3-ribbed, prominently tuberculate almost muricate.

N. Australia. Sturt's Crock, *F. Mueller*.

41. **F. obtusangula**, *F. Muell. Fragm. i.* 198. — Very closely allied to *F. solidifolia* and perhaps a variety only. Stature the same. Leaves more numerous and shorter. Involucral bracts very short, the

longest 3 to 5 lines long, rigid and almost pungent. Inflorescence and spikelets the same. Style flattened and more ciliate. Nut broadly obovoid-clavate.

N. Australia. Depot Creek, Upper Victoria River, *F. Mueller*.

Queensland. Bowen Downs, *Birch*.

42. ***F. miliacea*, Vahl; Kunth, Enum. ii. 230.**—Apparently annual. Stems tufted, slightly or very prominently 4-angled, 6 in. to about 2 ft. high. Leaves from much shorter to nearly as long, linear, tapering to a fine point; the sheathing base broad and open. Umbel compound, sometimes small with the longest ray about 1 in., sometimes above 6 in. long and very compound, the ultimate rays or pedicels usually horizontally spreading. Involucral bracts small and linear or rarely 1 nearly as long as the ray. Spikelets globular or nearly so, from $\frac{3}{4}$ to nearly $1\frac{1}{4}$ lines diameter. Glumes numerous, closely imbricate all round, broadly ovate, membranous, obtuse or scarcely mucronate, the keel fine but prominent, and frequently a broad brown streak on each side, the margins pale, sometimes hyaline. Stamen 1. Style glabrous; branches 3. Nut small, obovoid, whitish, 3-ribbed, granular tuberculate or almost muricate.—Bæckel. in Linnæa, xxxvii. 43; *F. Muell. Fragm. ix. 12*; *Trichelostyles miliacea*, Nees; Hook. f. Fl. Tasm. Præf. 48.

N. Australia. Upper Victoria River and near M'Adam Range, *F. Mueller*; between Norman and Gilbert Rivers, *Gulliver*.

Queensland. Rockhampton, *O'Shanesy*.

Common in tropical Asia, the Mascarene Islands and in tropical America, but the Senegambian plant referred to it by J. D. Hooker is probably different.

43. ***F. rara*, R. Br. Prod. 227.**—Apparently annual. Stems angular, 1 to 2 ft. high. Leaves much shorter, few, the inner ones or sometimes all reduced to sheathing scales with short erect laminæ or points. Umbel compound, rather loose, 2 to 4 in. broad, the pedicels slender. Involucral bracts very short. Spikelets shortly ovoid, $1\frac{1}{2}$ to 2 lines long, 1 line diameter. Glumes not near so numerous as in *F. miliacea*, loosely imbricate all round, broad, obtuse or shortly acuminate, keeled, the sides with broad hyaline margins. Stamens 3. Style glabrous; branches 3. Nut ovoid, 3-ribbed, granular-tuberculate.—*F. trachycarya*, *F. Muell. Fragm. i. 199*.

N. Australia. Arnhem Land, north coast, *R. Brown, Kinlay*; Depot Creek, Upper Victoria River, *F. Mueller*.

United by *F. Mueller, Fragm. ix. 12*, with *F. miliacea*, but the shape and structure of the spikelets, and the shape of the glumes, appear to me to be different, and I always find 3 stamens, whilst I have never seen more than 1, in the Australian specimens at least, of *F. miliacea*.

44. ***F. microcarya*, F. Muell. Fragm. i. 200.**—Apparently annual. Stems tufted, slender, angular, from 3 to 4 in. to above 1 ft. high. Leaves much shorter, rather numerous, flat and rather flaccid, from $\frac{1}{2}$ line to nearly $1\frac{1}{2}$ lines broad, with short open sheathing bases. Umbel

slender, irregular, but very compound, the rays and pedicels filiform, the longest rays 1 to 2 or rarely 3 in. long. Involucral bracts narrow and leafy but shorter than the rays. Spikelets not clustered but numerous, the smallest in the genus, brown, narrow-lanceolate, about $\frac{1}{2}$ line long when first out, lengthening to 1 or $1\frac{1}{2}$ lines or very rarely rather longer when old, not $\frac{1}{2}$ line broad, with 6 to 12 or rarely more flowers. Glumes loosely imbricate all round, acuminate, the point sometimes slightly spreading, the keel very prominent and sometimes slightly ciliate, especially in the outer ones, one only empty. Stamen 1. Style nearly glabrous, branches 3. Nut obovoid, whitish, with 3 prominent ribs, usually tuberculate.—*F. cyperoides*, F. Muell. Fragm. ix. 11, not of R. Br.

N. Australia. Sturt's and Depot Creeks, Upper Victoria River, *F. Mueller*; between Norman and Gilbert Rivers, *Gulliver*.

Queensland. Port Denison, *Fitzalan*; Boyd River and Dry-Beef Creek, *Leichhardt*; Herbert's Creek, *Bowman*; Rockhampton and neighbourhood, *Thozet*, *O'Shanesy*; Springsure, *Wuth*.

45. **F. quinquangularis**, *Kunth*, *Enum.* ii. 229.—Stems tufted, rather slender, more or less distinctly 4- or 5-angled, 1 ft. high or more, smooth or scabrous. Leaves sometimes nearly as long, narrow, flat or concave, glabrous, sometimes all reduced to loose sheathing scales, tapering into short erect laminae. Umbels compound, with very numerous small spikelets not clustered, the rays sometimes all short though slender, sometimes the longer ones attaining 3 in. Involucral bracts short or one nearly as long as the inflorescence. Spikelets ovoid or at length oblong, pale or dark brown, $1\frac{1}{2}$ to 2 lines long, 6- to 12-flowered. Glumes loosely imbricate all round, ovate, obtuse or shortly mucronate, the broad keel prominent and usually with a dark line on each side, the sides membranous and the margins sometimes scarios. Stamens 1 or 2 (rarely 3?). Style slender, nearly glabrous: branches 3. Nut ovoid-globular, obtusely triquetrous, tuberculate.—*Bœckel*. in *Linnaea*, xxxvii. 42; *Trichelostyles quinquangularis*, *Nees*; *Hook.* f. Fl. Tasm. Præf. 48.

N. Australia. Upper Victoria River, *F. Mueller*.

Common in East India, extending to the Mascarene Islands. The Australian specimens have paler spikelets than the Indian ones, but I can perceive no other difference.

46. **F. cyperoides**, *R. Br. Prod.* 228.—Stems from a creeping rhizome slender but rigid, 6 in. to above 1 ft. high. Leaves not numerous, very narrow or subulate, erect, with long open sheaths. Umbel compound, with filiform rays, the longest about 1 in. long. Involucral bracts few, subulate, the longest much shorter than the inflorescence. Spikelets not clustered, narrow, acute, brown, 2 to 3 lines long, $\frac{1}{2}$ to $\frac{3}{4}$ line broad, with 2 to 4 flowers. Glumes imbricate all round, erect, lanceolate, acute, membranous, keeled, the flowering ones about 2 lines long, 2 or 3 outer empty ones shorter, and 1 or 2 small empty ones above the flowers. Stamens 3. Style glabrous or nearly so, the bulbous base continuous and falling off with it as in the normal species;

branches 3. Nut obovoid-oblong, faintly 3-ribbed, whitish, rugose.—*F. cinnamometorum*, Kunth, Enum. ii. 229; (Bœckel. in Linnæa, xxxvii. 35;) *Abildgaardia cinnamometorum*, Thw. Enum. Pl. Zeyl. 347; *Abildgaardia fusca*, F. Muell. Fragm. viii. 273, not of Nees; *Fimbristylis biflora*, Bœckel. in Linnæa, xxxviii. 393.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Providence Hill, *F. Mueller*; Port Darwin, *Schultz*, n. 658.

Queensland. Wide Bay, *Bidwill*; Rockingham Bay, *Dallachy*.

N. S. Wales. New England, *C. Stuart*; Clarence River, *Becker*.

Also in the East Indian Peninsula and in Ceylon. It was by some mistake, probably from misnamed specimens, as are frequent among our Indian Cyperaceæ, that Thwaites referred the *Abildgaardia fusca*, Nees, to *A. cinnamometorum*, instead of to the *A. fulvescens*, Thw. The *F. cyperoides* is anomalous in the genus in its few flowers and the proportional number of empty glumes nearer that of *Rhynchospora*, but the style and other characters are quite those of *Fimbristylis*.

SERIES III. GLOMERATÆ.—Spikelets more or less clustered on the rays of the umbel and always a central sessile cluster of 2 or more in lieu of the ordinary single sessile central spikelet. Leaves usually numerous. Style-branches usually 3, but sometimes 2.

47. **F. furva**, *R. Br. Prod.* 228.—Probably perennial, glabrous and not glaucous. Stems tufted, 4 to 8 in. high, slightly flattened. Leaves shorter, numerous, more or less spreading, linear, flat, obtuse, flaccid, 1 to $1\frac{1}{2}$ lines broad. Umbel small and dense but compound, with few short rays, the spikelets mostly in clusters of 2 or 3 but some solitary. Involucral bracts small and glume-like or 1 or 2 produced into short points. Spikelets brown, ovoid or ovoid-oblong, about 2 lines long. Glumes imbricate all round, broad, the keel prominent and produced into a point very short in the inner glumes, longer in the lower ones with frequently a nerve on each side, the broad sides membranous and smooth. Stamens 2 or 3. Style slender, ciliate in the upper part; branches 3. Nut not seen full grown.

Queensland. Booby Island, *Banks and Solander*; Rockingham Bay, *Dallachy*.

Closely allied to the widely-spread tropical *F. glomerata*, Nees, with which Bœckeler correctly unites *F. Wightiana*, Nees, but our plant has not the rigid channelled leaves which give a peculiar aspect both to the Asiatic and the African specimens of that species, and the style appears to be constantly 3-branched.

48. **F. cymosa**, *R. Br. Prod.* 228.—Perennial and glabrous. Stems slender but rigid, $\frac{3}{4}$ to $1\frac{1}{2}$ ft. high. Leaves much shorter, numerous at the base, narrow, erect, rigid and shining. Umbel compound, the rays and pedicels spreading. Involucral bracts lanceolate, with fine points or laminae much shorter than the rays. Spikelets numerous, in clusters of 2 or 3 with solitary ones intermixed, ovoid, 1 to $1\frac{1}{2}$ lines long, pale brown. Glumes not numerous, loosely imbricate all round, membranous, keeled, the lower ones acute or acuminate, the upper ones obtuse. Stamens usually 3. Style slender, not ciliate; branches 3. Nut very small, acutely 3-angled, smooth or minutely granular.

N. Australia. Islands of the Gulf of Carpentaria and Prince of Wales' Islands, *R. Brown*; Escape Cliffs, *Hulse*.

Some of Hulse's specimens, apparently of the same species, have the rachis of the old spikelets much lengthened, but all the lower glumes fallen away.

49. **F. multifolia**, *Bæckel. in Linnæa*, xxxviii. 397.—Rhizome or stock thick, covered with the remains of old leaf-sheaths. Stems slender but rigid, triquetrous or flattened, 1 to $1\frac{1}{2}$ ft. high. Leaves crowded at the base of the stem and shorter, glaucous but glabrous, narrow, subulate-acuminate, with short open sheaths. Umbel irregularly compound, the longest rays $1\frac{1}{2}$ to 2 in., the spikelets in little clusters or heads of 3 to 10. Involucral bracts subulate-acuminate, dilated at the base, the longest much shorter than the rays. Spikelets ovoid, 1 to $1\frac{1}{2}$ lines long, 8- to 10-flowered. Glumes loosely imbricate, membranous, obtuse, prominently keeled, the sides pale-brown, without scarious margins. Stamens 3? Style scarcely pubescent, very slightly bulbous at the base; branches 3 (or 2?), short. Nut ovoid-globular, obtusely 3-angled, whitish, minutely granular.

N. Australia. Cygnet Bay, N. W. coast, *A. Cunningham*; Port Darwin, *Schultz*, n. 147, 799.

Very closely allied to the common Indian *F. juncifolia*, Kunth, (*Trichelostyles*, Nees), in which Bæckeler correctly includes *F. chætorhiza*, Nees, our plant differing slightly in its longer leaves, smaller spikelets, shorter glumes, etc.

50. **F. sericea**, *R. Br. Prod.* 228.—Rhizome or stock thick and covered with the remains of old leaf-sheaths. Stems 6 in. to 1 ft. high, rigid, angular, striate, silky-pubescent or at length glabrous. Leaves much shorter, crowded at the base of the stem, linear, thick, 1 to 2 lines broad, obtuse, silky-pubescent on the underside and sheaths. Umbel irregularly compound, the longer rays about $1\frac{1}{2}$ in., the spikelets in little clusters of 3 to 10. Involucral bracts lanceolate, acuminate, silky-hairy, much shorter than the rays. Spikelets about 2 lines long, with 2 or 3 perfect flowers. Glumes lanceolate or ovate-lanceolate, acute, navicular, prominently keeled, the sides nerveless, 2 outer ones shorter and empty and 1 or 2 upper ones also empty. Stamens 3. Style very shortly hairy; branches 3 (or 2). Nut not seen.—Bæckel. in *Linnæa*, xxxvii. 22.

N. Australia. Gulf of Carpentaria, *R. Brown*; Upper Victoria River, *F. Mueller*; Port Darwin, *Schultz*, n. 602.

Bæckeler refers to this species the *F. decora*, Nees, Kunth, Enum. ii. 240, from S. China and Java, in which he is probably right. The Australian plant has generally but not always 3 style-branches as described by Brown, whilst in the Chinese ones I have found only 2 in the spikelets examined, as described by Nees, Kunth, and Bæckeler.

51. **F. macrostachya**, *Bæckel. in Linnæa*, xxxviii. 386.—Perennial, glabrous but glaucous. Stems slightly angular or flattened, rigid, about 1 ft. high. Leaves shorter or nearly as long, narrow, rigid, flat or concave, with broad scarious sheaths truncate at the orifice. Spike-

lets large, in a dense cluster of 2 to 5, with 1 or 2 short lateral rays or pedicels bearing each 1 or 2. Involucral bracts short and rigid, the longest erect but shorter than the inflorescence. Spikelets oblong or ellipsoid, obtuse, 3 to 4 lines long, $1\frac{1}{2}$ to 2 lines diameter, pale brown. Glumes numerous, closely imbricate all round, broadly ovate, mucronate-acute or almost obtuse, rigid, the keel prominent, the sides striate, about 4 lower ones shorter and empty. Stamens 2 or 3. Style much flattened, ciliate; branches 2. Ovary contracted at the base, the full-grown nut unknown.

N. Australia. Port Darwin, *Schultz*, n. 664.

52. *F. Neilsoni*, *F. Muell. Fragm.* ix. 79.—Glabrous. Stems 1 ft. high or more. Leaves shorter, narrow, with broad scarious sheaths obtuse at the orifice. Spikelets large, in a dense cluster of 3 to 5, with 2 or 3 short lateral rays or pedicels, bearing each 3 or 4, forming a simple umbel. Involucral bracts rarely longer than the inflorescence. Spikelets ovate, 4 to 5 lines long. Glumes rather loosely imbricate, ovate, obtuse, membranous, hyaline towards the margin, the lower ones 2 lines long. Stamens 3. Style slender, glabrous; branches 3. Nut clavate-pyriform, 3-angled, pale-coloured, tuberculate.

N. S. Wales. In the interior, between the Darling and Barcoo Rivers, *Neilson*, between Rome and the Barcoo, *Birch*. Very closely resembles *F. macrostachya*; but differs in the thinner glumes, with broad hyaline margins, and in the slender glabrous and 3-branched styles.

SERIES IV. CAPITATÆ.—Spikelets collected in a single terminal head.

53. *F. capitata*, *R. Br. Prod.* 228.—Stems tufted, rather slender, often 1 ft. high. Leaves much shorter, few, linear, with short open sheaths, or reduced to sheathing scales. Head of spikelets dense and globular, 4 to 6 lines diameter, either terminal concealing the very short bract, or appearing lateral owing to the involucral bract continuing the stem and sometimes twice as long as the head, or the inflorescence proliferous emitting a short branch with a second head. Spikelets brown, ovate or oblong, 2 to 3 lines or when old 4 lines long, $1\frac{1}{2}$ to 2 lines broad. Glumes loosely imbricate in few rows, membranous, prominently keeled, obtuse or minutely pointed, the sides nerveless, 1 or sometimes 2 smaller outer ones empty. Stamens 3. Style glabrous or nearly so, the basal dilatation very small; branches 3. Nut obovoid-globular, the angles not prominent, tuberculate.—*F. cephalophora*, *F. Muell. Fragm.* i. 196.

N. Australia. Upper Victoria and Fitzmaurice Rivers, *F. Mueller*.
Queensland Endeavour River, *Banks and Solander*.

54. *F. Schultzii*, *Bæckel. in Linnæa*, xxxviii. 391.—Stems tufted, slender, 4 to 6 in. high. Leaves much shorter, rather numerous, narrow-linear but flat, with short open sheaths. Head of spikelets terminal, globular or at first hemispherical, 3 to 5 lines diameter. In-

volucral bracts 4 or more, linear, spreading or reflexed, 1, 2 or sometimes 3 longer than the head. Spikelets numerous, sessile, ovate, more or less flattened, $1\frac{1}{2}$ to 3 lines long, about $1\frac{1}{2}$ lines broad. Glumes not numerous, loosely imbricate, the prominent keel produced into a short or long more or less recurved point, the sides nerveless, thin with scarious hyaline margins. Stamens 2 or 8. Style glabrous; branches 3. Nut obovoid, 3-ribbed, minutely granular or almost smooth.—*F. platystachys*, Bæckel. in Linnæa, xxxviii. 390.

N. Australia. Sturt's Creek, *F. Mueller*; Port Darwin, *Schultz*, n. 96, 792.

The two numbers gathered by Schultz are distinguished as species by Bæckeler, and the separation is apparently justified by the specimens in the Berlin herbarium, but those of the Kew herbarium differ much less from each other, and *F. Mueller*'s specimens are quite intermediate in most respects. The length of the involucral bracts and the points of the glumes upon which the distinctions are chiefly founded are so variable, that I am unable to give tangible characters even for two distinct varieties.

SECTION IV. ONCOSTYLIS.—Spikelets capitate, umbellate, or in species not Australian solitary. Glumes imbricate all round the rachis. Style-bulb articulate on the nut, but often persisting a long time after the fall of the style.

I have followed Asa Gray in transferring this section from *Scirpus* (*Isolepis*) to *Fimbristylis*, of which it has entirely the habit, as the style-bulb, though persistent at first, very frequently falls away at the maturity of the nut.

55. F. barbata, Benth.—Apparently annual. Stems tufted, filiform, 3 to 8 in. high. Leaves much shorter, filiform, the sheaths loose at the apex and ciliate or bearded with long hairs. Spikelets 6 to 10 together in a single terminal sessile cluster or head. Involucral bracts few, filiform, 1 rather longer than the head. Spikelets brown, erect, narrow, 2 to 3 lines long. Glumes not numerous, erect, loosely imbricate, the very prominent usually 3-nerved and pale-coloured keel produced into a slightly recurved point, the sides membranous, almost scarious, nerveless. Stamen usually 1. Style glabrous; branches 3. Nut obovoid, slightly granular, the minute bulbous base of the style long persistent, but articulate on the nut and sometimes falling away at maturity.—*Scirpus barbatus*, Rottb.; Bæckel. in Linnæa, xxxvi. 751; *Isolepis barbata*, R. Br. Prod. 222; Kunth, Enum. ii. 208; *F. Muell.* Fragm. ix. 7.

N. Australia. Gulf of Carpentaria, *R. Brown*; Dampier's Archipelago, *Walcott*; Depot Creek, Upper Victoria River, *F. Mueller*; Port Darwin, *Schultz*, n. 170, 211.

Queensland. Bustard Bay, *Banks and Solander*; Rockingham Bay, *Dallachy*; Dawson River, *F. Mueller*; Dry Beef Creek, *Leichhardt*; Gainsford, *Bouman*; Bowen Downs, *Birch*.

N. S. Wales. Clarence River, *Wilcox*.

Central Australia. Between Alice Springs and Charlotte Waters, *Giles*.

Widely spread over the tropical regions of the Old World.

56. **F. capillaris**, *A. Gray, Man. Bot. N. U. S. ed. 5, 567.*—Annual. Stems tufted, filiform, 3 to 9 in. high. Leaves much shorter, numerous, filiform. Umbel simple or slightly compound, of few short filiform rays. Involucral bracts small and glume-like, or 1 or 2 produced into a filiform point shorter than the inflorescence. Spikelets ovoid-oblong, about 2 lines long, not clustered. Glumes not numerous, loosely imbricate, the keel very prominent, pale-coloured, produced into a minute slightly spreading point, the sides brown and nerveless. Stamens 2 or 3. Style slender, glabrous; branches 3. Nut small, obovoid, prominently 3-angled, very obtuse, the minute bulbous base of the style articulate but long persistent, usually however falling off at maturity.—*Scirpus capillaris*, Linn.; Bæckel. in Linnæa, xxxvi. 759; *Isolepis capillaris*, Ræm. et Schult.; Kunth, Enum. ii. 211; F. Muell. Fragm. ix. 7.

Queensland. Rockingham Bay, *Dallachy*; Sandy Creek, *Herb. F. Mueller*.
W. Australia, *Drummond*, n. 916.

Widely spread over the tropical and subtropical regions of the New and the Old World, extending into the more temperate districts of North America.

5. SCIRPUS, Linn.

(*Isolepis*, Br.; *Malacochaete*, Nees.)

Spikelets clustered, irregularly umbellate or rarely solitary, with several usually many hermaphrodite flowers. Glumes imbricate all round the rhachis, all flowering or the lowest 1 rarely 2 empty. Hypogynous bristles none or 3 to 8, ciliate with minute reflexed hairs or flattened into plumose scales. Stamens 3, 2 or 1. Style deciduous, more or less divided into 2 or 3 filiform stigmatic branches, the base scarcely thickened, continuous with the nut and remaining as a small point or tubercle. Nut obovoid globular triquetrous or flat.—Small tufted annuals, or if perennials sometimes tall and stout, the rhizomes often creeping or sometimes slender long and floating. Leaves few at the base of the stems or in tufts on the rhizome; sometimes reduced to an appressed sheath with or without a short lamina, sometimes very long. Inflorescence sometimes terminal with 2 or more unequal long involucral bracts as in *Cyperus*, more frequently more or less lateral with one erect involucral bract continuing the stem, in a few species the bract subtending the solitary terminal spikelet is short and glume-like.

The genus is truly cosmopolitan, thriving alike within the tropics, and in Arctic, Antarctic, and Alpine regions, mostly in marshes, sometimes actually in water, rare in dry localities. Of the twenty-three Australian species eight only are endemic, four more are also found in New Zealand or South Africa or both, and one of these also in extratropical South America, the remaining eleven belong generally to the tropical temperate or cold regions of the Old World, at least seven of them being also found in America.



I have followed Asa Gray and Bœckeler in reuniting *Isolepis* with *Scirpus*, for the sole character by which they are distinguished, the absence of the bristles in the former, is variable in two or three species, and in other instances separate species so closely allied that Bœckeler has united them as varieties. In the great majority of species however the character is so constant and so frequently attended by a difference in inflorescence, that there is a convenience in retaining the two groups at least as artificial sections. On the other hand, Nees' section or genus *Oncostylis*, retained by Bœckeler in *Scirpus*, appears to me to be much more naturally referred by Asa Gray to *Fimbristylis*, of which it has the inflorescence, and the bulbous base of the style, although often long persistent on the nut, is articulate with it, and often falls off from the perfectly ripe fruit.

SECT. I. *Isolepis*.—No hypogynous bristles (except very rarely in *S. supinus*). Small or slender plants (except the last few species).

- Spikelets small, in numerous dense heads, almost radical in a tuft of grass-like filiform involucreal bracts . . . 1. *S. humillimus*.
 Spikelets solitary. Style-branches 2. Nut biconvex. Stamens usually 3.
 Spikelet narrow, few-flowered, 1 to 2 lines long. Stem or filiform rhizome often elongated and floating . . . 2. *S. fluitans*.
 Spikelet ovate, dark-brown, under 2 lines long. 10-16 flowered. Glumes broad many-nerved . . . 3. *S. arenarius*.
 Spikelet ovate, pale-brown, under 2 lines long, 3- to 5-flowered . . . 4. *S. lenticularis*.
 Spikelet ovate, 2 to 4 lines long, many-flowered. Nut orbicular, biconvex in the centre only, the edge thickened . . . 5. *S. crassiusculus*.
 Spikelets solitary or clustered. Style-branches 2. Nut very flat. Stamens 2. Spikelet compressed. Spikelet solitary ovate and terminal . . . 6. *S. brizoides*.
 Spikelets clustered or rarely solitary, narrow-oblong usually lateral . . . 7. *S. cyperoides*.
 Spikelets solitary or clustered, small, (1 to 2 lines) ovoid or ovoid-oblong, terminal or nearly so. Style-branches 3 rarely 2. Stamens 3 rarely 2. Glumes prominently keeled. Nut very small, obovoid globular or 3-ribbed; marked with longitudinal furrows. Spikelets 1 to 3 . . . 8. *S. setaceus*.
 Nut very small, obtusely triquetrous, smooth. Spikelets 1 to 3 . . . 9. *S. riparius*.
 Nut acutely triquetrous. Spikelets solitary or clustered . . . 10. *S. cartilagineus*.
 Stamens 1 or 2. Spikelets clustered. Glumes narrow with long recurved points. Nut very narrow . . . 11. *S. squarrosus*.
 Stamen 1. Spikelets usually clustered, sometimes proliferous. Glumes broad. Nut acutely triquetrous . . . 12. *S. inundatus*.
 Spikelets clustered, above 2 lines long, oblong or narrow. Style-branches 3.
 Spikelets in a terminal frequently proliferous cluster . . . 13. *S. prolifer*.
 Spikelets in a lateral cluster. Stems continuous, not thick. Spikelets few in the cluster. Nuts transversely wrinkled . . . 14. *S. supinus*.
 Stems pithy with transverse septa inside. Spikelets in dense clusters. Nuts smooth . . . 15. *S. articulatus*.

Spikelets small and very numerous in a dense globular lateral cluster 16. *S. nodosus*.

SECTION II. **Euscirpus**. *Hypogynous bristles 3 to 8. Plants mostly tall and stout.*

Spikelets in sessile lateral clusters.

Stems terete. Style-branches 2. Nut flat 17. *S. debilis*.

Stem acutely 3-angled. Style-branches 3.

Spikelets many. Glumes entire 18. *S. mucronatus*.

Spikelets usually 3. Glumes mostly emarginate or 2-lobed 19. *S. pungens*.

Spikelets in a terminal or nearly terminal simple or compound irregular umbel or cluster.

Involucral bract very short, erect and rigid. Style-branches 2.

Bristles filiform, with short reflexed cilia 20. *S. lacustris*.

Bristles or scales flattened, plumose with lax hairs 21. *S. littoralis*.

Involucral bracts several, unequal, leaflike. Style-branches 3.

Spikelets few and large (6 to 7 lines). Hypogynous bristles short 22. *S. maritimus*.

Spikelets very numerous in a compound inflorescence 3 to 4 lines long. Hypogynous bristles very long, capillary and flexuose 23. *S. polystachyus*.

SECTION I. **ISOLEPIS**.—Hypogynous bristles none or small and rare.

The greater number of the Australian species are small or slender, often annual and very different in aspect from the large typical *Scirpi*, but the two or three last of the following species assume the habit of the first two or three *Euscirpi* and the bristles are sometimes present in *S. supinus*, whilst they are occasionally very small or deficient in *S. debilis*.

1. ***S. humillimus*, Benth.**—A dwarf plant forming dense tufts with numerous small heads of spikelets, apparently radical at the base of grass-like linear-filiform involucral bracts 1 to 2 in. long, the real stems either undeveloped or from $\frac{1}{4}$ to $\frac{1}{2}$ in. long, and leafless below the inflorescence. Heads of spikelets 2 to 3 lines diameter, the depressed cluster of heads often 1 to 2 in. diameter. Involucral bracts several to each cluster, the outer ones slightly dilated at the base, erect and numerous enough in the plant almost to conceal the inflorescence. Spikelets 1 to $1\frac{1}{2}$ lines long, all sessile and numerous in the head. Glumes numerous, imbricate all round but spreading at the apex, oblong, rather obtuse, membranous with a dark centre forming a slightly prominent keel towards the end. No hypogynous bristles. Style-branches 3. Nut very small, rather broad, triquetrous, tipped with a small point.—*Isolepis acaulis*, F. Muell. in Herb. Kew.; Hook. f. Handb. N. Zeal. Fl. 302 in obs., not of Philippi.

N. Australia. South Alligator River, Arnhem Land, F. Mueller. This curious little plant has much of the aspect of the New Zealand *Isolepis basilaris*, Hook. f., and something of the habit of the *S. acaulis*, Bœckel. from Chili, but perfectly

distinct in many characters from both. F. Muell. Fragm. ix. 7, includes it in *Isolepis Micheliana* (*Cyperus pygmaeus*) from which it appears to me to be much further removed.

2. **S. fluitans**, Linn.; Backel. in *Linnaea*, xxxvi. 485.—Rhizomes filiform, elongated when in water and floating in large masses with tufts of 2 or 3 leaves at the nodes, when growing out of water the rhizome scarcely developed. Leaves filiform, 1 to 2 in. long, dilated at the base into a short open sheath. Stems or peduncles about the length of the leaves, one in each tuft. Spikelet solitary, terminal, pale-coloured or dark-brown, ovate-oblong, $1\frac{1}{2}$ to 2 lines long with 4 to 8 flowers in the typical form. Glumes obtuse or scarcely acute, finely or obscurely striate, with a dorsal keel, all flowering except the lowest which is similar to the others or rather longer, very rarely produced into an erect linear lamina of 2 or 3 lines. Stamens 3. Style-branches 2. Nut ovate or broad, usually white, biconvex, tipped by a very small point or tubercle.—Reichb. Ic. Fl. Germ. t. 298; *Isolepis fluitans*, R. Br. Prod. 221; Kunth, Enum. ii. 188; Hook. f. Fl. Tasm. ii. 86.

N. S. Wales. Port Jackson, R. Brown, Wools; New England, C. Stuart.

Victoria. Near Mount William, Sullivan.

Tasmania. Abundant in rivers and pools throughout the island, J. D. Hooker.

S. Australia. Tamunda, F. Mueller; Macclesfield, Blandowski.

Var. *terrestris*, F. Muell. Stems tufted, the rhizome scarcely developed. Spikelets fully 2 lines long, with rather more flowers than in the typical form.—*Isolepis lenticularis*, Hook. f. Fl. Tasm. ii. 86, t. 145, not of R. Brown.—Near Mount Macedon, F. Mueller; near Mount William, Sullivan; near Formosa, Gunn; South Esk River, C. Stuart.

Var. *microstachya*. Rhizome leaves and peduncles as in the typical form, but more capillary. Spikelet scarcely 1 line long.

N. S. Wales. Port Jackson, C. Moore.

Victoria. Upper Robinson and Yarra Rivers, F. Mueller.

W. Australia. Drummond, n. 322, 362; Tweed River, Oldfield.

The species is spread over the tropical and temperate regions of the Old World.

3. **S. arenarius**, Benth.—A dwarf rather rigid plant, the stems loosely tufted on a short but slender creeping rhizome, 1 to 2 in. high, leafless except a rather loose brown sheath oblique at the orifice, with a very short erect obtuse lamina. Spikelet solitary, terminal, erect or oblique, ovate, 1 to $1\frac{1}{2}$ lines long, usually dark brown, 10- to 16-flowered. Glumes short and broad, almost orbicular, concave, obtuse, not striate, very obscurely keeled towards the end, the empty one or subtending bract erect but not very different from the others, rarely produced into a short point. No hypogynous bristles. Style-branches 2. Nut orbicular, white, biconvex, the terminal point exceedingly minute.

Victoria. Wet sands, Wilson's Promontory, *F. Mueller*.

W. Australia, *Drummond*, n. 360.

Var? *setiformis*. Stems filiform, densely tufted, leaf-sheaths with a slender point of 2 to 4 lines.—Mount Barker, W. Australia, *Oldfield*. Perhaps a distinct species.

4. ***S. lenticularis***, *Spreng. Syst.* i. 208.—Stems filiform, 1 to 3 in. high. Leaves shorter, 1 on each stem but numerous in the tuft. Spikelet solitary, lateral but erect, the involucre bract erect, linear, 2 to 3 lines long and rather broad, the spikelet oblong or ovate, 1 to $1\frac{1}{2}$ lines long, with only 3 to 5 flowers. Glumes ovate acuminate or ovate-lanceolate, loosely imbricate, keeled, finely striate. No hypogynous bristles. Stamens 2 or 3. Style-branches 2. Nut oval, nearly as long as the glume, biconvex, smooth, pale-coloured.—*Isolepis lenticularis*, *R. Br. Prod.* 222.

N. S. Wales. Port Jackson, *R. Brown*.

5. ***S. crassiusculus***, *Hook. f.*—Rhizome stemlike, creeping and rooting at the nodes or elongated under water, not so slender as in *S. fluitans*, and apparently not floating. Leaves long and linear or sometimes filiform, but longer and usually stouter than in *S. fluitans*. Stem 3 to 5 in. long: Spikelet solitary, terminal, pale brown or greenish, ovate, 3 to 4 lines long, usually with twice as many flowers as in *S. fluitans*. Glumes ovate-oblong, obtuse, distinctly striate, obtusely keeled, the margins often scarious. No hypogynous bristles. Stamens 3. Style-branches 2. Nut very flat, nearly orbicular, slightly biconvex in the centre, thinner towards the margin and there thickened into an obtuse edge, the terminal point rather long.—*Isolepis crassiuscula*, *Hook. f. Fl. Tasm.* ii. 86. t. 143.

Victoria. Haidinger Range and Munyong Mountains, *F. Mueller*.

Tasmania. Arthur Lakes and Mount Wellington, *Gunn*; sources of the Derwent, Lake St. Clair, *Gulliver*.

6. ***S. brizoides***, *Benth.*—Stems tufted, 2 to 4 in. high, with a single short narrow leaf. Spikelet solitary, terminal, ovate, usually brown, 2 to 3 lines long, $1\frac{1}{2}$ to 2 lines broad, considerably flattened, the subtending bract very short. Glumes imbricate all round or almost in 3 rows, broader than in *S. cyperoides*, the keel scarcely prominent. No hypogynous bristles. Stamens 2. Style-branches 2. Nut nearly orbicular, flat or slightly biconvex.

W. Australia. Swan river? *Drummond*, n. 919; Vasse River, *Oldfield*. Very near *S. cyperoides*, but as far as the specimens show appears distinct in inflorescence as well as in the shape of the spikelet.

7. ***S. cyperoides***, *Spreng. Syst.* i. 208.—Stems tufted, usually 3 to 6 in. high, with a single narrow leaf much shorter than the stem. Spikelets in a cluster of 3 to 6, at first terminal but usually thrown to one side by the longer erect involucre bract sometimes $\frac{1}{2}$ to 1 in. long,

the second bract much shorter, rarely the spikelet solitary and lateral, shorter than the involucre bract. Spikelets oblong-lanceolate, 3 to 4 lines long, rather more than 1 line broad, more or less flattened. Glumes imbricate all round or almost in 3 rows, erect, the keel prominent green and usually produced into a short erect point, the sides striate, often brown. No hypogynous bristles. Stamens 2. Style-branches 2. Nut brown, flat or biconvex.—*Isolepis cyperoides*, R. Br. Prod. 222.

W. Australia. King George's Sound and neighbouring districts, *R. Brown*, *Drummond*, n. 43 and 920, *Oldfield*, *F. Mueller*.

8. *S. setaceus*, Linn.; Bæckel. in Linnæa, xxxvi. 500 partly.—Stems tufted, filiform or subulate, mostly 1 to 3 in. but sometimes 6 to 8 in. long. Leaves few, short and filiform. Spikelets solitary or 2 or 3 together, terminal or more frequently thrown to one side, the principal or only involucre bract erect and continuing the stem, sometimes very short sometimes $\frac{1}{2}$ in. long. Spikelets ovate or lanceolate, $1\frac{1}{2}$ or rarely 2 lines long. Glumes few, the keel prominent and often produced into a very short point, the sides nerveless or faintly nerved, brown or more frequently pale coloured. No hypogynous bristles. Stamens 3, rarely 2. Style-branches 3. Nut small, globular or obovoid, more or less distinctly 3-ribbed and marked by longitudinal striæ or furrows.—*Reichb. Ic. Fl. Germ.* t. 301; *Isolepis setacea*, R. Br. Prod. 222; *Kunth, Enum.* ii. 193; *Hook. f. Fl. Tasm.* ii. 88; *I. multicaulis*, *Schlecht. Linnæa*, xx. 562.

N. S. Wales. Macleay River, *Beckler*; Clarence River, *Wileox*; New England, *Perrott*.

Victoria. Snowy River, *F. Mueller*, near mount William, *Sullivan*.

Tasmania. Near Penquite, *Gunn*; Southport, *C. Stuart*.

S. Australia. Barossa Range, *Behr*. I have not seen these specimens, but *Schlechtendahl* expressly describes the nuts of the typical *S. setaceus*.

W. Australia. Stirling Range, *F. Mueller*.

The typical form, often confounded with *S. riparius*, has been satisfactorily identified in various parts of the Old World, chiefly in extratropical regions in the southern as well as in the northern hemisphere.

9. *S. riparius*, Spreng. Syst. i. 208.—Very closely allied to *S. setaceus* and referred to it as a variety by *Bæckeler*, differing only in the nut, which is smooth or minutely granular, without the prominent striæ and furrows of *S. setaceus*. It varies much in form, sometimes globular or obovoid as in *S. setaceus*, sometimes obtusely but equally triquetrous or more frequently in Australian specimens with a broad inner face, the back very convex or obtusely angled but these forms pass so gradually one into another as to make it very difficult to sort the specimens into distinct varieties. The nut is always shorter and never so prominently 3-angled as in *S. cartilagineus*.—*Isolepis riparia*, R. Br. Prod. 222; *Nees in Pl. Preiss.* ii. 74; *Hook. f. Fl. Tasm.* ii. 89, t. 145, c.; *I. Saviana*, *Schult.*; *Kunth, Enum.* ii. 193; *Hook. f. l.c.* ii. 88;

Scirpus setaceus, var. Bœckel. in Linnæa, xxxvi. 502; *S. Savii*, Spreng. Syst. i. 207; Reichb. Ic. Fl. Germ. t. 301; *Isolepis congrua*, Nees in Pl. Preiss. ii. 75 (according to Bœckeler).

N. S. Wales. Port Jackson, *R. Brown*, and probably from thence also, *Sieber* (Agrosth. n. 20).

Victoria. Wendu Vale, *Robertson*; Wimmera, *Dallachy*; Murray River, *F. Mueller*, and numerous scattered localities, *F. Mueller* and others.

Tasmania. Kent's Group, Bass's Straits, *R. Brown*; abundant in wet places, *J. D. Hooker* and others.

S. Australia. Mount Lofty, Bethanie, etc., *F. Mueller*.

W. Australia. *Drummond*, n. 361; Preiss, n. 1729 (with filiform stems 10 in. long); Blackwood River, *Oldfield*.

The species is dispersed over the New as well as the Old World, chiefly however without the tropics.

10. ***S. cartilagineus***, *Spreng. Syst. i. 208.—Stems slender, almost filiform, densely tufted, usually 1 to 3 in. but sometimes at least twice as high. Leaves much shorter, few and filiform or all reduced to sheathing scales with a short erect point. Spikelets 3 to 6 together in a terminal cluster, or in some specimens all reduced to a single one, sometimes thrown a little to one side. Involucral bracts 2, subulate, one often $\frac{1}{2}$ in. long erect or spreading, the other very short. Spikelets ovoid-oblong, 1 to 2 or rarely $2\frac{1}{2}$ lines long. Glumes not numerous, often in 3 rows, obtuse or the prominent keel produced into a very short erect point, the sides rather broad, smooth or striate with very fine nerves, pale coloured, but frequently marked by a dark spot. No hypogynous bristles. Stamens usually 3. Style-branches 3. Nut ovoid, half as long as the glume or longer, prominently 3-angled, the terminal point minute or obsolete.—*Isolepis cartilaginea*, *R. Br. Prod. 222*; Nees in Pl. Preiss. ii. 73; Hook. f. Fl. Tasm. ii. 88. t. 145; *I. Bergiana*, *Schult.*; *Kunth, Enum. ii. 194*; *Scirpus Bergianus*, *Spreng.*; Bœckel. in Linnæa, xxxvi. 693; *Isolepis notata*, Nees in Pl. Preiss. ii. 74.*

Victoria. Yarra River, *F. Mueller*; *Adamson*; Cobberas Mountains, *F. Mueller*; Wimmera and Murray Rivers, *Dallachy*.

Tasmania. Kent's group, Bass's Straits, *R. Brown*; abundant in sandy and moist places, *J. D. Hooker*.

S. Australia. Bugle and Lofty Ranges, Gawlertown, Mount Torrens, *F. Mueller*.

W. Australia. King George's Sound to Swan River and Rottenest Island, *R. Brown*; *Drummond*, n. 917, 918, *Preiss*, n. 1738, 1741, 1742, 1743, 1751, 1752, *Oldfield* and others.

Var. *alpina*. Stems and leaves rather stouter. Glumes rather larger, pale-coloured.—*Isolepis alpina*, *Hook. f. Fl. Tasm. ii. 86*, t. 143, B., *Scirpus Gunnii*, Bœckel. in Linnæa, xxxvi. 493.—Alpine Bogs, Lake St. Clair, Arthurs Lakes, etc. in Tasmania, *Gunn* and others; also the same variety but not quite so marked, Snowy Mountains, Victoria, *F. Mueller*.

Var. *propinqua*. Spikelets frequently solitary. Glumes more obtuse, the keel less prominent. Nut rather shorter and broader.—*Isolepis propinqua*, Nees in Ann. Nat. Hist. ser. i. vi. 46, not of *R. Br.* To this belong *Preiss*'s n. 1744, 1746 and several

other West Australian specimens, and apparently also Sieber's specimens, *Agrostotheca* n. 20, which however may not be Australian.

Nees describes his *I. notata* as monandrous, but, in Preiss's specimen's both 1751 and 1752, I have found 3 stamens or in one flower only 2.

Some specimens from Victoria, *F. Mueller*, in Herb. Kew., without the precise station, have usually more than 6 spikelets in the cluster and the points of the glumes longer and slightly recurved, but they appear to belong to this species.

The *S. Bergianus*, correctly identified with the *S. cartilagineus*, is also in South Africa and in New Zealand.

11. *S. squarrosus*, Linn.; Bœckel. in Linnæa, xxxvi. 734, var. *Dietrichia*.—Stems slender, tufted, 3 to 6 in. high or rarely more. Leaves shorter, setaceous. Spikelets 3 to 6 together in a terminal cluster. Involucral bracts usually 3, spreading, linear-subulate, one usually 1 to 2 in. long, the others much shorter. Spikelets ovoid-conical; $1\frac{1}{2}$ to 2 lines long or at length rather elongated with the lower glumes very deciduous so as to appear pedicellate. Glumes very numerous, linear or somewhat cuneate, 3-nerved, tapering into a long recurved point. No hypogynous bristles. Stamens 1 or 2. Style short; branches 2 or 3. Nut in the Australian variety very narrow, almost linear, slightly compressed.—*Scirpus Dietrichia*, Bœckel. in Flora, 1875, 109 (from the char. given).

N. Australia. In the interior, lat $17^{\circ} 50'$, *M'Dougal Stuart's Expedition*.
Queensland. Rockhampton, *Amalia Dietrich*, if correctly identified.

The species (*Isolepis squarrosa*, Rœm. et Schult.; Kunth, Enum. ii. 202), extends over tropical Asia and Africa, but the nut is there usually broader and shorter than in our Australian specimens.

12. *S. inundatus*, Spreng. Syst. i. 207.—A very variable plant, sometimes with the dwarf slender habit of *S. cartilaginea*, sometimes elongated with the proliferous inflorescence of *S. prolifer*. Stems slender, often filiform, and when thicker much less so than in *S. prolifer*, from scarcely above 1 in. to near 1 ft. long, with usually a single short leaf, sometimes reduced to the sheath with a small point. Spikelets 3 to 6 or more together in a terminal cluster, the involucral bracts shorter or one more frequently subulate and longer than the cluster, rarely attaining $\frac{1}{2}$ in. Spikelets ovate-oblong, rather acute, rarely above 2 lines long, usually brown. Glumes concave, ovate, obtuse or the scarcely prominent keel produced into a short point, the sides striate with dark streaks or slightly prominent nerves or quite smooth, rarely pale coloured throughout, and then often dotted. No hypogynous bristles. Stamens always 1 only and very frequently the filament persistent at the back of the nut. Style-branches 3; rarely 2. Nut rather broad, equally and prominently 3-angled or more or less flattened, smooth, the terminal point minute.—*Isolepis inundata* and *I. propinqua*, R. Br. Prod. 222; *I. prolifera*, Hook. f. Fl. Tasm. ii. 87, t. 144, not of R. Br.; *I. conspersa*, Nees in Endl. Prod. Pl. Norf. 23;

I. Gaudichaudiana, Kunth, Enum. ii. 201; *I. Urvillei* and *I. Gunnii*, Steud. Syn. Glum. ii. 94; *Scirpus conspersus* (partly), *S. Urvillei*, *S. costatus*, (partly) and *S. Gaudichaudii*, Bæckel. in Linnæa, xxxvi. 505, 510, 511.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*.

N. S. Wales. Port Jackson to the Blue Mountains, *C. Moore*, *Woolfs* and many others; New England, *C. Stuart*, *C. Moore*; Richmond River, *Fawcett*; Hastings River, *C. Moore*.

Victoria. Yarra River, *F. Mueller*; Dandenong Ranges, *Lachmann*; Rod Jacket Creek, *Gargurevich*.

Tasmania. Abundant in wet places, sometimes also under water or in dry places. *J. D. Hooker*.

S. Australia. Bethanie and Lofly Ranges, *F. Mueller*.

Var. floribundus. Stems densely tufted, scarcely exceeding 2 in. Spikelets 10 to 16 or even more, in dense heads of 3 to 3½ lines diameter, one bract sometimes 1 in. long and rigid.—Upper Loddon River, *F. Mueller*.

The species is also in New Zealand and in Norfolk Island. The various forms it assumes have been well alluded to by Hooker, l. c., but in the large number of specimens now before me I am unable to sort them into distinct varieties, as most of the diversities in form are individual rather than genetic. Brown's *I. propinqua*, represents the prevailing state; his *I. inundata* is exactly like it, except that the style is exceptionally 2-merous. *I. conspersa*, Nees, is a not uncommon state rather larger than usual, but the Tristan d'Acunha plant included in it by Bæckeler is the *I. sulcata*, Carnich. with 3-androus flowers besides a more rigid habit, looser leaf-sheaths, etc. *I. conspersa*, Nees is said by him to be 3-androus probably through inadvertence. I find only one stamen in Bauer's specimens, as in all those I have examined of the numerous forms of *S. inundatus*.

13. **S. prolifer**, *Rottb. Descr. et Ic. Pl. 55, t. 17, f. 2*.—Stems tufted or shortly creeping at the base, from a few inches to above 1 ft. long, weak but much thicker than in *S. inundatus*, leafless except a sheathing scale oblique at the orifice. Spikelets several, often many, in a terminal cluster or head which is often proliferous emitting 1 or more short branches of ½ to 2 in. terminating in a small cluster of spikelets. Involucral bracts short and glume-like, concealed under the cluster. Spikelets oblong, 2 to 4 lines long, pale coloured. Glumes ovate, obtuse, scarcely striate, but marked with longitudinal brown lines. No hypogynous bristles. Stamens usually if not always 3. Style-branches 3. Nut short, prominently 3-angled, smooth or minutely granular, the terminal point very small.—Bæckel. in Linnæa, xxxvi. 692; *Isolepis prolifer*, R. Br. Prod. 223; Kunth, Enum. ii. 201.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *Agrostoth. n. 21*, *J. D. Hooker*, *C. Moore*, *Woolfs*; New England, *C. Stuart*. A South African species which R. Brown thinks may have been introduced into N. S. Wales.

14. **S. supinus**, *Linn.*; *Bæckel. in Linnæa*, xxxvi. 699, *excl. var β and γ*.—Stems tufted, decumbent or erect, striate, from 2 or 3 in. to above 1 ft. long, leafless except a rather long sheathing scale often produced into a short narrow lamina. Spikelets 2 to 6 together in a lateral cluster, the outer involucral bract erect and continuous with the

stem often 2 in. long and only slightly dilated at the base. Spikelets oblong, 2 to 4 lines long. Glumes prominently keeled, acute or the keel produced into a conspicuous point, loosely imbricated and generally very deciduous. Hypogynous bristles none or very short and few. Stamens 2 or 3. Style-branches 3. Nut broad, prominently 3-angled, or rarely biconvex, prominently marked with transverse wrinkles.—Reichb. Ic. Fl. Germ. t. 302: *Isolepis supina*, R. Br. Prod. 221; Kunth, Enum. ii. 196; F. Muell. Fragm. ix. 6.

Queensland. Keppel Bay, R. Brown, Brisbane River, Bailey.

N. S. Wales. Nepean River, R. Brown.

Victoria. Lake Lalbert, F. Mueller.

Widely spread over the tropical and temperate regions of the Old World, more rare in the southern states of North America.

15. *S. articulatus*, Linn.; Bœckel. in Linnæa, xxxvi. 702.—Stems terete, hollow, more or less distinctly septate inside so as to appear articulate, 2 or 3 in. to 2 ft. high. Spikelets numerous in a dense lateral cluster, the involucrel bract erect and continuous with the stem, precisely like it and often as long as or longer than the true stem. Spikelets ovoid or oblong, 3 to 6 lines long, 2 lines diameter at the base or rather more, pale brown. Glumes broad, rather acute or mucronate, slightly striate, the keel scarcely prominent. Hypogynous bristles none or rarely few and minute. Stamens 3. Style-branches 3. Nut prominently and acutely 3-angled.—*Isolepis articulata*, Nees; Kunth, Enum. ii. 198; *I. prælongata*, Nees; Kunth, l. c. 199; F. Muell. Fragm. ix. 6.

N. Australia. Mouth of Victoria River, F. Mueller.

Queensland. Near Rockhampton, Thozet.

Common in tropical Asia and Africa.

16. *S. nodosus*, Rottb. Descr. et Ic. Pl. 52, t. 8, f. 3.—Rhizome creeping. Stems rigid, rush-like, terete or slightly flattened, 1 to 3 ft. high, leafless except the sheathing scales at the base. Spikelets small and numerous, in a dense globular lateral head varying from 3 to 9 lines diameter, the rigid erect involucrel bract continuing the stem $\frac{1}{2}$ to $1\frac{1}{2}$ in. long. Spikelets ovoid, 2 to 3 lines long in the ordinary form, about 2 lines diameter, of a dark brown. Glumes broadly ovate, obtuse or scarcely mucronate, their base rather rigid almost scarious, nerveless or finely nerved, the keel scarcely prominent. No hypogynous bristles, but the torus slightly produced within the stamens into a minutely 3-toothed disk approaching that of *Ficinia*. Style-branches 3. Nut short, broad, smooth and shining, the inner face flat, the back more or less distinctly angled.—Bœckel. in Linnæa, xxxvi. 718; *Isolepis nodosa*, R. Br. Prod. 221; Kunth, Enum. ii. 199; Nees in Pl. Preiss. ii. 73; Hook. f. Fl. Tasm. ii. 87; Rich, Fl. Nov. Zel. t. 18; F. Muell. Fragm. ix. 6.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *Agrostotheca*, n. 29, and others; Richmond River, *Mrs. Hodgkinson*; Clarence River, *Wilcox*; Tweed River, *Guilfoyle*; Lord Howe's Island, *Fullagar*.

Victoria. Port Philip, *Gunn*, *Adamson*; Portland and Emu Creek, *Robertson*.

Tasmania. *R. Brown*; common on the sand hills of the northern shore, *J. D. Hooker*.

S. Australia. Port Lincoln, *R. Brown*; Encounter Bay, *Wilhelmi*; St. Vincent's Gulf, *F. Mueller*.

W. Australia. King George's Sound, *R. Brown*, *F. Mueller*; Swan River, *Drummond*, 1st coll. also n. 384, *Preiss*, n. 1870; Gordon and Murchison Rivers, *Oldfield*.

Var. *macrostachya*. Spikelets at length 4 or 5 lines long. Glumes acute or mucronate.—Murchison River, *Oldfield*; Buffalo, *Pries*.

The species is also in New Zealand, South Africa, and extratropical South America.

SECTION II. EUSCIRPUS.—Hypogynous bristles 3 to 8, very rarely deficient in some individuals.

The first three species have nearly the habit of the last two or three of the section *Isolepis*, the others are all tall and stout. The *S. acicularis*, with the habit of the small slender species of *Heloecharis* or *Fimbristylis*, but with the characters of *Euscirpus*, so common in the temperate regions of the northern hemisphere, has not yet been found in Australia.

17. S. debilis, *Pursh*; *Kunth*, *Enum.* ii. 159.—Very nearly allied to *S. supinus*, and referred to it as a variety by Bœckeler, but differs in the glumes and nuts as well as in the bristles. Stems often 1 foot high or more, erect, less rigid than in the following species but more so than in *S. supinus*. Spikelets lateral, in close clusters of 2 or 3 or solitary, the erect involucrel bract continuing the stem. Spikelets ovoid or ovoid-oblong, 3 to 5 lines long, 2 to 3 lines diameter. Glumes numerous, closely imbricate, not at all or scarcely deciduous, broad almost orbicular, concave, keeled only at the summit, obtuse or minutely pointed. Hypogynous bristles 4 to 6, longer or shorter than the nut, rarely wanting in an American variety. Stamens 2. Style-branches 2. Nut much flattened, minutely rugose or dotted in Indian and American specimens, almost muricate in the Australian ones examined.—*S. juncooides*, *Roxb.*; *Kunth*, *Enum.* ii. 160; *S. supinus*, var. β . and γ . Bœckel. in *Linnaea*, xxxvi. 700, 701.

N. Australia. Upper Victoria River and Sturt's Creek, *F. Mueller*.

Queensland. Gainsford, *Bowman*.

Also in East India and North America.

18. S. mucronatus, *Linn.*; *Kunth*, *Enum.* ii. 161.—Stems tufted, stout, very acutely 3-angled, 1 to 3 ft. high, leafless except the sheathing scales at the base, the innermost ones sometimes produced into a short point. Spikelets rather numerous, in a dense lateral sessile cluster; the erect involucrel bract perfectly continuous with the stem and 1 to 2 in. long. Spikelets ovoid-oblong, 4 to 6 lines long, 2 to 3 lines diameter, pale brown. Glumes ovate, concave, obtuse or almost acute, membranous, more or less striate, the keel prominent and often

green in the upper part. Hypogynous bristles 6 or fewer, usually longer than the nut. Style-branches 3. Nut rather small, generally dark coloured, the broad inner face flat, the back convex or angled.—R. Br. Prod. 223; Reichb. Ic. Fl. Germ. 303; Bœckel. in Linnæa, xxxvi. 703; F. Muell. Fragm. ix. 8.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *C. Stuart*, *Bailey*; Daintree River, *Fitzalan*; Burnett River, *F. Mueller*; Rockingham Bay, *Dallachy*.

N. S. Wales. Paterson River, *R. Brown*; Clarence River, *Beckler*, *Wilcox*; Tweed River, *Robinson*; Richmond River, *Woolfs*.

Also in tropical and temperate Asia and in Europe.

19. **S. pungens**, *Vahl*; *Kunth*, *Enum.* ii. 162.—Rhizome creeping. Stems usually stout, 1 to 3 ft. high, acutely 3-angled. Leaves few and sometimes only 1 with a very long sheath, the lamina shorter or rarely longer than the stem. Spikelets in a lateral cluster of 3 to 6 or rarely more or reduced to a single one, the angular or flattened erect involucre bract continuing the stem and 1 to 3 in. long. Spikelets ovoid or oblong, dark brown, 3 to 4 lines or rarely $\frac{1}{2}$ in. long, 2 to 3 lines diameter. Glumes membranous, broad, entire emarginate or 2-lobed, the keel usually prominent in the upper part only and produced into a very short or rather long point, the sides nerveless. Hypogynous bristles 6 or fewer, usually shorter than the nut and sometimes wanting. Style-branches 3. Nut rather broad, pale coloured, the inner face flat, the back convex or with a prominent angle.—Bœckel. in Linnæa, xxxvi. 708; Reichb. Ic. Fl. Germ. x. 304; F. Muell. Fragm. ix. 8; *S. triquetra*, R. Br. Prod. 223; Hook. f. Fl. Tasm. ii. 89, not of Linn.

Victoria. Near Mount Emu, Lake Colac, Hopkins River, etc.; *F. Mueller*; mouth of the Glenelg, *Allitt*.

Tasmania. Derwent River, *R. Brown*; near Hobarton, *Gunn*; Macquarrie Harbour, *Milligan*.

S. Australia. Torrens River and Crystal Brook, *F. Mueller*; Port Lincoln, *S. R. Browne*.

W. Australia. *Drummond*, 4th coll. n. 359.

Var. *nanus*. Stems 2 to 3 in. high. Leaves almost radical. Spikelets small and solitary.—Lake Colac, *F. Mueller*. Perhaps rather a starved state than a variety.

Var. ? *longisetis*. Bristles much longer than the nut.—Lake Eyre, South Australia, *Andrews*. The spikelets appear to be several imbricate in a compound cylindrical spike of $\frac{3}{4}$ in., but the single specimen insufficient for accurate determination.

The species is also in New Zealand, in extra-tropical North and South America, and of the western Mediterranean region.

20. **S. lacustris**, *Linn.*; *Kunth*, *Enum.* ii. 164.—Stems stout, 2 to 5 ft. high, terete or obtusely triquetrous at the apex, leafless except a long loose sheathing scale sometimes continued into a short erect lamina. Spikelets numerous in an irregularly compound umbel appearing lateral, but the erect involucre bract continuing the stem usually much shorter than the inflorescence, nearly terete, channelled on the

inner side and dilated at the base. Spikelets ovoid and about 4 lines long or at length oblong-cylindrical and $\frac{1}{2}$ in. long, brown coloured. Glumes numerous, scarious, usually very broad, scarcely keeled except at the end, very obtuse and often emarginate, with or without a short point in the notch. Hypogynous bristles 6 or fewer, minutely ciliate with reversed hairs as in the majority of the section, mostly shorter than the nut. Stamens 3. Style-branches 2. Nut broad, much flattened, tipped with a small point or tubercle.—Bœckel. in Linnæa, xxxvi. 712; R. Br. Prod. 223; Reichb. Ic. Fl. Germ. x. 306; F. Muell. Fragm. ix. 7; *S. Meyenii*, Nees in Pl. Preiss. ii. 75.

Queensland. Port Denison, *Fitzalan*; Barcoo Downs, *Birch*; Rockhampton, *Thozet*.

N. S. Wales. Port Jackson and Hunter's River, *R. Brown*; New England, *C. Stuart*; Richmond River, *Woolfs*.

Victoria. Wannen River, *Robertson*; Port Phillip, *Gunn*; Yarra, *F. Mueller*; Skipton, *Whan*.

Tasmania. Derwent River, *F. Mueller*.

S. Australia. Port Adelaide, *F. Mueller*.

W. Australia. Swan River, *Preiss*, n. 1872; Murchison River, *Oldfield*.

Extends over both the New and the Old World, chiefly in extra-tropical regions.

21. *S. littoralis*, Schrad.; Kunth, Enum. ii. 166.—A tall stout species, with the habit and inflorescence of *S. lacustris*. Stems terete or 3-angled towards the apex, 2 to 5 ft. high, leafless except the sheathing scales at the base often ending in short erect laminæ. Umbel looser and less compound than in *S. lacustris*, with fewer spikelets, the erect involucrel bract continuing the stem short or as long as the inflorescence, channelled along the inner side or more distinctly triquetrous. Spikelets oblong or cylindrical, often above $\frac{1}{2}$ in. long when full grown and about 2 lines diameter. Glumes broad, scarious, often pale coloured, entire or slightly emarginate. Hypogynous bristles or scales 4 or rarely 5 or 6, much flattened, plumose with soft rather long hairs directed upwards. Stamens usually 3. Style-branches 2. Nut broad, much flattened, tipped by a small point or tubercle.—Reichb. Ic. Fl. Germ. 309; F. Muell. Fragm. ix. 7; *S. plumosus*, R. Br. Prod. 223; *S. triqueter*, Gren. et Godr. Fl. Fr. iii. 373; Bœckel. in Linnæa, xxxvi. 716, not of Linn.; *Malacochaete littoralis*, Nees.

N. Australia. Gulf of Carpentaria, *R. Brown*, *F. Mueller*; Victoria River, *F. Mueller*; Roper River, *Gulliver*.

Queensland. Broad Sound, *R. Brown*; Brisbane River, Moreton Bay, *C. Stuart*, *Henne*.

N. S. Wales. Paramatta, *Woolfs*.

Also in the Mediterranean region, at least I am unable to detect any difference in the specimens from the two distant areas. Grenier and Godron, misled by their interpretation of the Linnean character, referred this to his *S. triqueter*, which, however, as well by the specimen in his herbarium as by the figure of Plukenet's to which he refers, proves to have been correctly identified by Kunth and others with the plant described by Grenier and Godron under the name of *S. Pollichii*, the essential character distinguishing the two species derived from the hypogynous bristles or scales was overlooked both by Linnæus and by Schrader.

22. **S. maritimus**, Linn.; Kunth, *Enum.* ii. 167.—Rhizome creeping, often thickened into hard tubers. Stems 1 to 3 ft. high, triquetrous, smooth or slightly scabrous. Leaves often longer. Spikelets solitary or 3 together on each peduncle, forming sometimes a terminal irregular umbel of few unequal rays, sometimes contracted into a sessile cluster. Involucral bracts few, the lowest long leafy and erect, apparently continuing the stem, the others short or 1 or 2 of them long and leaflike. Spikelets in the Australian varieties ovoid or ovoid-oblong, 6 to 9 lines long, 3 to 4 lines diameter. Glumes broad, brown and scarious, the midrib or keel 1- or 3-nerved and produced into an erect or recurved point or awn, the broad scarious nerveless sides jagged at the end or forming 2 lobes shorter than the awn. Hypogynous bristles 6 or fewer, mostly shorter than the nut. Stamens 2 or 3. Style-branches 3 or rarely 2. Nut in the typical form broad, usually black when ripe, the inner face flat or nearly so, the back convex or obtusely angled.—Böckel. in *Linnaea*, xxxvi. 722; R. Br. *Prod.* 224; Hook. f. *Fl. Tasm.* ii. 89; F. Muell. *Fragm.* ix. 8; Reichb. *Ic. Fl. Germ.* t. 310, 311.

Queensland. East coast, R. Brown; Port Mollé, M'Gillivray; King's Creek, Bowman; Condamine River, Leichhardt; Brisbane River, Moreton Bay, C. Stuart.

N. S. Wales. Port Jackson, R. Brown; Paramatta and Richmond, Woolls; Clarence River, Wilcox.

Victoria. Yarra River, Adamson, F. Mueller, Lake Colac, F. Mueller.

Tasmania. Abundant in salt and brackish marshes, J. D. Hooker.

S. Australia. Bethanie, F. Mueller.

W. Australia. Swan River, Drummond, n. 936; Murchison River, Oldfield; Busselton, Pries.

Var. *fluviatilis*. Stem 3 to 5 ft. high, acutely 3-angled. Involucre and inflorescence more developed than in the typical form. Nut equally triquetrous.—*S. fluviatilis*, A. Gray; F. Muell. *Fragm.* ix. 8. To this variety belong most of the Queensland and N. S. Wales specimens, amongst others Brown's, from Port Jackson, which he distinguishes as var. β from his typical Queensland specimens. Some from the lower Yarra are remarkable for the very tall stout acute-angled stems and the number of the long leafy involucral bracts. These specimens have all triquetrous narrow but rather small nuts; the N. American have the nuts very much larger and white. Some of Robertson's Victoria specimens are said to be 5 ft. high, but the stems less stout and the nuts variable, usually as it were intermediate between the two common forms. The species extends over the tropical and temperate regions both of the New and the Old World.

23. **S. polystachyus**, F. Muell. in *Trans. Phil. Soc. Vict.* i. 108, and in Hook. *Kew Journ.* viii. 333; *Fragm.* ix. 9.—Stems 2 to 4 ft. high, more or less triquetrous. Leaves several along the stem with long sheaths, the lamina often 3 or 4 lines broad at the base, the uppermost as long as or longer than the stem. Umbel large loose and compound, of numerous rather slender rays, the longest 3 or 4 in. long. Spikelets clustered on the partial rays or distinctly but shortly pedicellate, ovate-oblong, 3 to 4 lines long, and $1\frac{1}{2}$ to near 2 lines diameter. Glumes oblong or ovate, obtuse, the keel and sometimes 1 nerve on each side prominent. Hypogynous bristles about 6, very slender and flexuose, 2 or 3 times as long as the nut. Style-branches 3. Nut broad, the inner face flat, the back convex or obtusely angled.

N. S. Wales. Clarence River, *Wilcox*; Mount Mitchell, *Beckler*.

Victoria. Lake Omco, Hume, Mitta Mitta and Snowy Rivers, *F. Mueller*.

This species has the peculiar hypogynous bristles and something of the habit of the European *S. radicans*, Schkuhr, but appears to be quite distinct in the larger more clustered spikelets and some other characters.

6. LIPOCARPHA, R. Br.

Spikelets in a terminal cluster or head, with numerous hermaphrodite flowers. Glumes imbricate all round the rachis, the lowest 1 or rarely 2 empty. Hypogynous scales 2, parallel to the glume, as long as or longer than the nut and enclosing it. Stamens 1 or 2 (rarely 3?). Style deciduous, slender, with 2 or 3 stigmatic branches. Nut oblong, somewhat compressed, obtuse or crowned by a very small persistent base of the style.—Annuals or perennials, the stems leafy at the base only. Spikelets few, small, sessile. Involucral bracts leaflike narrow unequal, spreading.

A small genus spread over the tropical regions of the New and the Old World. Both the Australian species are also in the Malayan Archipelago, and one of them has a very wide tropical range.

In the Flora Hongkongensis, misled by the approximation of the genus by some botanists to *Kyllinga* and by others to *Hypolytrum*, I described the flowers as 1-flowered spikelets, enclosed in heads resembling spikelets, but a closer examination convinces me that it is really very close to *Scirpus* (*Isolepis*), and connects that genus with *Fuirena*. The two hypogynous scales are never lateral and carinate like the outer scales or bracteoles of *Hypolytrum*, but appear to correspond in every respect with the scales of *Fuirena*, *Hemicarpha*, and of *Scirpus littoralis*, differing in number, usually 1 in *Hemicarpha*, 2 in *Lipocarpa*, 3 in *Fuirena*, and 4 in *Scirpus littoralis*.

Usually perennial, often above 1 ft., with linear leaves.

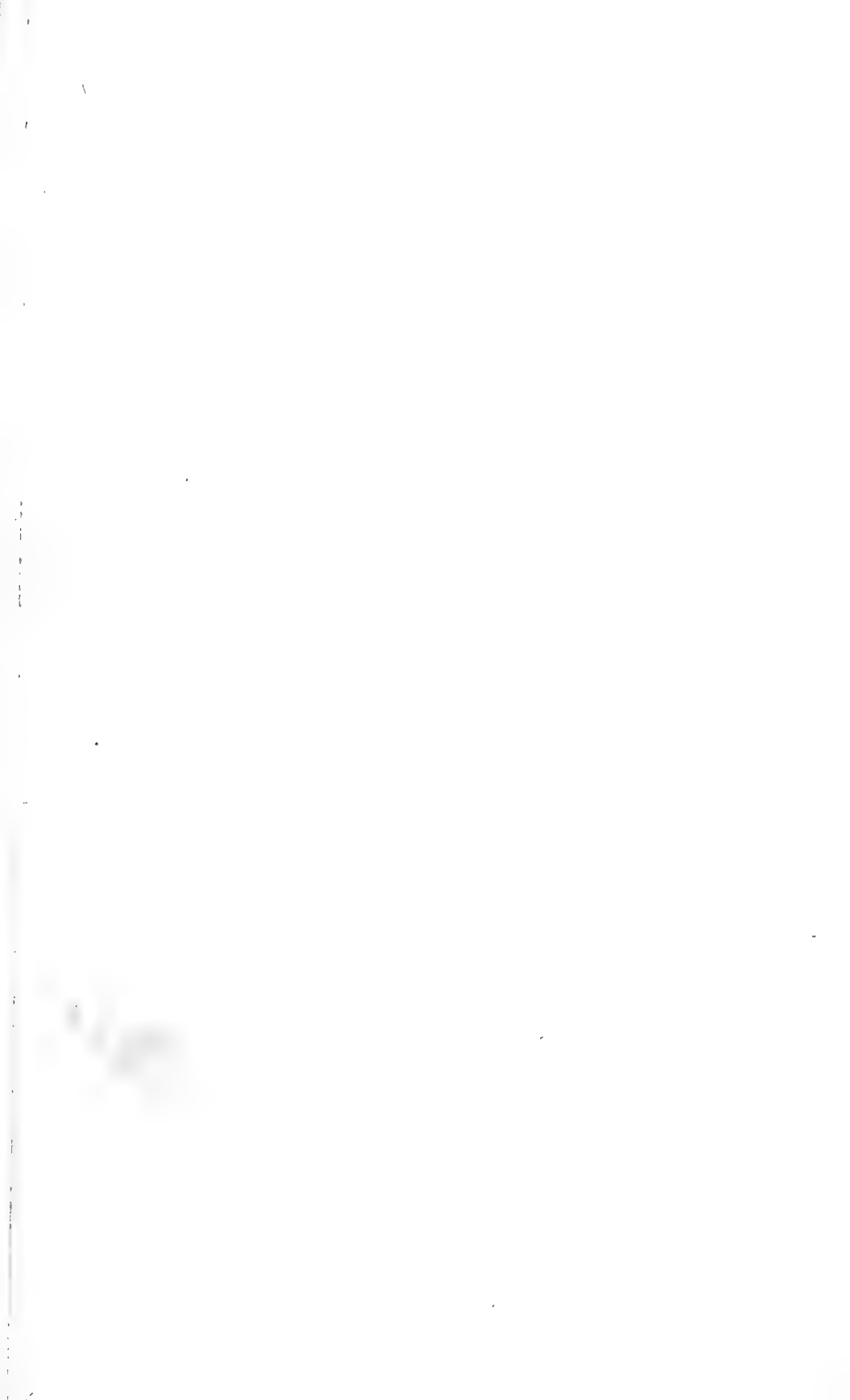
Glumes spatulate or broadly cuneate, scarcely pointed. 1. *L. argentea*.

Annual, under 6 in., with filiform leaves. Glumes narrow,
with spreading points 2. *L. microcephala*.

1. ***L. argentea*, R. Br. App. Tuck. Congo, 40.**—Stems from a perennial rhizome attaining 1 to 1½ ft. Leaves much shorter, flat, 1 to 1½ lines broad, with short open sheaths, or the inner one with a long closed sheath and short lamina. Spikelets 3 to 5, in a dense terminal head. Involucral bracts 3 or 4, spreading, the longest often 3 or 4 in. long, the others much shorter. Spikelets at first nearly globular, at length ovoid or ovoid-conical, nearly white, 3 or rarely 4 lines long. Glumes very numerous, closely imbricate, spatulate or obovate-cuneate, thin and almost hyaline, rounded at the end but the broad central nerve often produced into a short point. Hypogynous hyaline scales oblong. Stamen 1. Style-branches 3. Nut oblong, much flattened, obtuse, smooth.—Kunth, Enum. ii. 266; Boeckl. in *Linnaea*, xxxvii. 114; *Hypælyptum argenteum*, Vahl; F. Muell. *Fragm.* viii. 238.

Queensland. Brisbane River, *Bailey*. Widely spread over the tropical regions of the Old World, and perhaps in America also, although the Columbian specimens I have seen do not quite agree with the Asiatic ones. As it is only known in Aus-





tralia from this one gathering it may be doubtful whether it may not have been introduced.

Vahl's name, *Hypelytrum*, was a mistake for *Hypolytrum*, as pointed out by Brown, l. c., Vahl having intended to include this species in Richard's genus of that name.

2. *L. microcephala*, Kunth, Enum. ii. 268.—A tufted annual, the very slender stems usually from 1 or 2 to 6 in., but sometimes nearly 1 ft. high. Leaves shorter, very narrow, with rather broad striate sheaths. Spikelets usually 3, but varying from 1 to 5 or very rarely more. Involucral bracts very narrow, the longest 1 to 2 in. long. Spikelets ovoid-conical, $1\frac{1}{2}$ to 2 lines long. Glumes very numerous, narrow, slightly cuneate, acuminate, the green keel produced into a short usually spreading point. Hypogynous hyaline scales narrow. Stamens 1 or 2. Style-branches 2. Nut oblong-linear, compressed, rather acute or almost obtuse, rather shorter than the hypogynous scales.—Bœckel. in Linnæa, xxxvii. 118; *Hypelytrum microcephalum*, R. Br. Prod. 220; F. Muell. Fragm. viii. 238; *Scirpus leptocarpus*, F. Muell. in Trans. Phil. Soc. Vict. i. 109, and in Hook. Kew Journ. viii. 334.

N. Australia, Arnhem S. Bay, *R. Brown*; between Norman and Gilbert Rivers, *Gulliver*; Port Darwin, *Schultz*, n. 78.

Queensland. Rockingham Bay, *Dallachy*; Herbert Creek, *Bowman*; Dry-beef Creek, *Leichhardt*; Rockhampton, *O'Shanesy*.

Victoria. Murray, Ovens, and King's Rivers, *F. Mueller*.

7. FUIRENA, Linn.

Spikelets clustered, with several usually many hermaphrodite flowers. Glumes imbricate all round the rachis, the lowest 1 or rarely 2 empty. Hypogynous scales 3, broad, usually 3-nerved, often alternating with small bristles. Stamens 3; anthers small. Style deciduous, with 3 stigmatic branches. Nut 3-angled.—Perennials or annuals with leafy stems. Leaf-sheaths crowned with an annular membrane. Clusters of spikelets terminal and in the upper axils, usually forming an irregular narrow terminal panicle or the clusters few and distant. Spikelets usually pubescent or hirsute.

The genus consists of but few species dispersed over the warmer regions of the New as well as the Old World, the Australian ones having both a general distribution over nearly the whole area.

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|--|--------------------------|
| Leaves glabrous. Glumes shortly pointed. Hypogynous scales contracted at the base but sessile or nearly so, without bristles | 1. <i>F. umbellata</i> . |
| Leaves pubescent or at least ciliate. Glume-points long, often recurved. Hypogynous scales cordate at the base, stipitate, usually alternating with bristles | 2. <i>F. glomerata</i> . |

1. *F. umbellata*, Rottb. Descr. et. Ic. Pl. 70, t. 19, f. 3.—Perennial. Stems $1\frac{1}{2}$ to 3 ft. long, 4- or 5-angled, glabrous. Leaves glabrous, the larger ones 4 to 6 in. long, 4 to 5 lines broad, the lowest with long

sheaths and short laminæ, the upper ones passing into small floral leaves or sheathing bracts. Spikelets brown-green, usually 3 to 4 lines long, sparingly hirsute, in very dense clusters, of which 1 or 2 terminal, the others 1 or 2 together pedunculate in the upper axils. Glumes ovate, very prominently 3-nerved, produced into an erect or slightly recurved point, much shorter than in *F. glomerata*. Hypogynous scales brown, obovate, nearly $\frac{1}{2}$ line long, truncate and mucronate at the top, contracted at the base but nearly sessile without any intervening bristles. Nut rather broad, acutely triquetrous, mucronate with the slightly thickened persistent base of the style.—Kunth, Enum. ii. 185; Bœckel. in Linnæa, xxxvii. 110; R. Br. Prod. 220; F. Muell. Fragm. viii. 238.

N. Australia. Providence Hill and sources of the Limmen-Bight River, F. Mueller.

Queensland. Endeavour River, Banks and Solander; Port Curtis, M'Gillivray; Rockingham Bay, Dallachy; Rockhampton, Bowman.

2. *F. glomerata*, Lam.; Kunth, Enum. ii. 184.—Apparently annual. Stem weak, rarely above 1 ft. high. Leaves more or less pubescent or at least ciliate on the edges. Spikelets rather larger than in *F. umbellata*, either in a single terminal cluster with a leafy bract at the base, or more frequently with the addition of 1 or 2 almost sessile clusters in the upper axils. Glumes obovate, 3-nerved, produced into a rather long usually spreading or recurved point. Hypogynous scales very variable, but always distinctly stipitate and more or less cordate, usually truncate at the top and sometimes with a long terminal seta, white and thickened towards the apex or brown and membranous throughout, alternating with bristles sometimes as long as themselves, sometimes very short. Style-branches occasionally 2 only but usually 3. Nut obovoid, acutely 3-angled.—Bœckel. in Linnæa, xxxvii. 107; R. Br. Prod. 220; F. Muell. Fragm. viii. 238; *Scirpus ciliaris*, Linn.; Rottb. Descr. et Ic. Pl. t. 17. f. 1; *F. arenosa*, R. Br. Prod. 220.

N. Australia. Upper Victoria River and Providence Hill, F. Mueller; Port Darwin, Schultz, n. 256 and 282 (the latter a long very slender starved state); between Norman and Gilbert Rivers, Gulliver.

Queensland. Endeavour River, Banks and Solander, A. Cunningham; Keppel Bay, R. Brown; Cape York, Daemel; Rockingham Bay, Dallachy; Rockhampton and neighbourhood, Thozet, Bowman and others; Brisbane River, Moreton Bay, F. Mueller, Bailey; Dry-boef Creek, Leichhardt. Brown's *F. arenosa* was founded upon old weak specimens from Point Lookout, Banks and Solander, from which the flowers and glumes have mostly fallen away.

TRIBE II. HYPOLYTREÆ.—Spikelets solitary clustered or paniculate, with several usually numerous flowers; all hermaphrodite or some male only. Glumes imbricate all round, several of the lowest empty. Flowers within the glumes flat, with 2 complicate keeled hypogynous scales (or bracteoles?), and often flat linear scales within them.

8. HYPOLYTNUM, Rich.

Spikelets numerous, in a corymbose panicle rarely contracted into a







dense cluster, with several often numerous hermaphrodite flowers. Glumes imbricate all round the rachis, several of the lower ones smaller and empty. Flowers flat. Hypogynous scales (bracteoles?) 2, placed right and left, complicate, the keel acute usually ciliate, no inner flat ones. Stamens 3 or fewer. Style slender, deciduous; stigmatic branches 2 or 3, filiform. Nut hard, obtusely 3-angled or compressed, smooth or irregularly wrinkled.—Usually coarse perennial plants with leafy stems. Panicles compound, with long leafy involucre bracts. Spikelets small.

The genus comprises but few species dispersed over the tropical and subtropical regions of the New and the Old World, the Australian species having a very wide general range.

1. *H. latifolium*, *Rich.*; *Kunth, Enum.* ii. 271.—Stems acutely 3-angled, 2 to 4 ft. high. Leaves usually longer, $\frac{1}{2}$ to 1 in. broad, with 3 prominent nerves and more or less scabrous on the margins and midrib. Panicle densely corymbose, 3 to 4 in. diameter, with 2 to 4 long leafy involucre bracts. Spikelets very numerous, oblong-cylindrical at first, ovoid when in fruit, 2 to 3 lines long. Glumes numerous, broadly ovate, obtuse or scarcely mucronate, the midrib slightly prominent, otherwise nerveless, 3 or 4 of the lower ones empty and more acute. Hypogynous scales or bracteoles prominently keeled when in flower, opened out and nearly flat under the fruit, shorter than the glume. Stamens 2. Style-branches 2 (or 3?). Nut when fully ripe nearly globular, slightly compressed, rather longer than the glume, very obtuse and smooth, in some specimens narrower conical at the top and somewhat rugose but perhaps not ripe.—*F. Muell. Fragm.* viii. 238; *H. giganteum*, *Wall.*; *Bot. Mag.* t. 6282; *Bœckel. in Linnæa*, xxxvii. 131.

Queensland. Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*. Common in tropical Asia and Africa, and closely allied to if not identical with an American species.

9. EXOCARYA, Benth.

Spikelets small, umbellate-paniculate, with 1 or 2 hermaphrodite flowers and 2 or 3 male ones below them. Glumes imbricate all round, several lower ones empty. Flowers flattened. Hypogynous scales 4, 2 outer ones (bracteoles?) placed right and left, complicate, keeled, 2 inner flat or concave, parallel with the glume. Stamens 3. Style dilated at the base into a hard bulb, with 2 linear stigmatic branches. Nut exserted, crowned by the persistent bulb of the style.—Stem leafy. Umbel compound, the general and partial rays slender with a central sessile spikelet as in *Fimbristylis*.

The genus is limited to the single species, endemic in Australia.

1. *E. scleroides*, *Benth. in Hook. Ic. Pl.* t. 1206.—Stems from a creeping rhizome 2 ft. high or more but slender and weak, 3-angled,

leafy throughout. Leaves grass-like, long and flat, 1 to 2 lines broad, tapering into long subulate points, the sheaths close. Umbel large and slender, very compound, the longest rays 4 to 6 in. long, filiform as well as the pedicels. Involucral bracts several, like the leaves, but the longest scarcely so long as the inflorescence. Spikelets 1 to $1\frac{1}{2}$ lines long, narrow-oblong, dark brown. About 6 empty glumes all obtuse, the outer ones very short, the inner gradually passing into the longer flowering ones. Male flowers usually about 3, and 1 rarely 2 hermaphrodite flowers in the spikelets examined. Hypogynous scales as long as the glume, the 2 outer complicate ones with shortly ciliate keels, the 2 inner ones parallel to the glume and flat or concave. Stamens 3. Style-bulb black, larger than the ovary at the time of flowering but not enlarged afterwards. Nut quite exserted, erect, ovoid-oblong, very obtuse, about 2 lines long and $1\frac{1}{2}$ lines diameter, smooth but not shining, the remains of the spikelet forming a small tuft at its base.—*Cladium scleroides*, F. Muell. Fragm. ix. 12.

Queensland. Araucaria Forests on the Dawson and Burnett Rivers, *Leichhardt*.
N. S. Wales. Richmond and Clarence Rivers, *Wileox*; Richmond River and Liverpool Plains, *C. Moore*.

In technical characters this elegant plant approaches very nearly to *Mapania*, and is as it were intermediate between that genus and *Hypolytrum*, but the inflorescence, the minute spikelets and the exserted nuts larger than the whole spikelet give it a very different aspect from any species of either genus.

10. MAPANIA, Aubl.

(*Pandanophyllum*, Hassk. *Thoracostachyum*, Kurz.)

Spikelets solitary clustered or paniculate, with numerous hermaphrodite flowers. Glumes imbricate all round the rachis, a few of the lowest empty. Flowers flattened. Hypogynous scales 6 (or in species not Australian more?), 2 outer ones (bracteoles?) placed right and left, complicate, the keel acute, usually ciliate; 4 inner ones flat or concave, narrow, thin, often several-nerved but without any prominent midrib, one next the glume, the 3 others alternating with the stamens. Stamens usually 3; 2 lateral and 1 next the glume. Style slender, glabrous, deciduous; stigmatic-branches 3, filiform. Nut sessile, triquetrous or flattened.—Stout perennial plants usually with long broad leaves. Stems leafless or leafy at the base only, sometimes scape-like with a single large spikelet or head of spikelets and small involucral bracts, sometimes with a terminal head corymb or panicle of few or numerous spikelets and long or large leafy involucral bracts. Spikelets usually large.

The genus is now known to contain a considerable number of species from the tropical regions of America, Africa and Asia, extending to the South Pacific Islands. The only Australian one is endemic, approaching one from the Malayan Archipelago, but with the inflorescence much more developed than in any extra-Australian species. The spikelet is generally described as a spike, the flowers as androgynous spikelets with 3 male flowers with single glumes and stamens, 3 empty glumes and a central female flower without any glume. The view however above given appears to be







more in harmony with the known structure of the Cyperaceæ such as *Scirpus* and *Hypolytrum*. The spikelet as a whole is very much like that of the larger species of *Scirpus*, the two outer navicular scales within the glumes are evidently homologous to those of *Hypolytrum*, and the four inner ones to the scale-like bristles of *Scirpus littoralis*. In some extra-Australian species there appears to be an increase in the number of scales and perhaps of stamens, but so also is there an increase in the number of bristles in some species of *Scirpus*. Many of the larger species of *Mapania* require much farther examination and it is very rarely that herbarium specimens are available for the purpose.

1. *M. hypolytroides*, F. Muell.—Stems stout, 3-angled. Leaves '4 ft. long,' 1 to 2 in. broad, with scabrous edges. Panicle dense, very compound, 6 to 10 in. diameter. One or two of the lower involucrel bracts 1 to 2 ft. long and $\frac{1}{2}$ to 1 in. broad, tapering into long points. Spikelets very numerous, shortly pedicellate, said to be white when fresh, light brown when dry, ovoid, 3 to 4 lines long, about 2 lines diameter. Glumes closely imbricate, ovate or oblong, obtuse, thin, with only a very slender central nerve especially on the outer ones, 3 or 4 of the lowest smaller and empty. Hypogynous scales all narrow, thin and rather shorter than the glume, the two outer ones (or bracteoles) with ciliate keels, the four inner ones glabrous. Style-branches 3. Young nut triquetrous, but not seen full grown.—*Hypolytrum pandanophyllum*, F. Muell. Fragm. ix. 16.

Queensland. Rockingham Bay, *Dallachy*. The nearest approach to this species is the *M. sumatrana* (*Thoracostachyum*, Kurz in Journ. Asiat. Soc. Beng. xxxviii. 75; *Lepironia sumatrana*, Miq. Ill. Fl. Archip. Ind. 62. t. 24), which however has a much more slender stem, narrow leaves, a small corymbose panicle, and glumes of a different texture.

11. SCIRPODENDRON, Kurz.

Spikelets in dense clusters, with numerous hermaphrodite flowers. Glumes imbricate all round the axis, a few of the lower ones empty. Flowers flattened. Hypogynous scales several, 2 outer ones (bracteoles?) placed right and left, complicate, the keel acute, usually ciliate, the inner ones flat or concave without any prominent midrib. Stamens 6 (or more?). Style slender, glabrous, with 3 or 2 short filiform branches. Nut large, woody, with very prominent longitudinal ribs.—Stout plant with long broad leaves. Stems leafless or leafy at the base only. Clusters of spikelets in a dense thyrsoid panicle, with long leafy involucrel bracts.

The genus is limited to a single species dispersed over the Malayan Archipelago and apparently also in Ceylon and the Samoa Islands. It is closely allied to *Mapania* and *Lepironia*, differing from both in the nut, the largest known in the order.

1. *S. costatum*, Kurz in Journ. Asiat. Soc. Beng. xxxviii. 85.—Stems from a thick woody rhizome stout, 3-angled, 1 to 2 ft. high. Leaves 6 to 9 ft. long, 1 in. broad or more, 3-nerved, with scabrous margins. Clusters of spikelets sessile or nearly so, in a dense oblong-thyrsoid panicle, the lower leafy involucrel bracts 1 to 2 ft. long.

Spikelets ovoid, 4 to 5 lines long, 2 to 3 lines diameter. Glumes closely imbricate, very broad and thin, many-nerved and readily splitting into as many shreds. Scales as long, apparently more than 6 besides the 2 outer complicate ones or bracteoles, but splitting so readily that I have been unable to ascertain their number. Stamens 6 or in one flower examined 7; anthers very long. Nut ovoid conical or nearly globular, 4 to 6 lines diameter, with 6 to 10 very prominent thick longitudinal ribs, the apex truncate or convex in the Australian specimen frequently conical in others.—*S. sulcatum*, Kurz (by a clerical mistake?) Miq. Ill. Fl. Archip. Ind. 65. t. 28; *Hypolytrum costatum*, Thw. Enum. Pl. Zeyl. 346, according to Kurz.

Queensland. Daintree River, *Fitzalan*.

The single specimen seen in herb. F. Mueller consists only of an inflorescence with ripe nuts, but it agrees very well with some of the Archipelago ones from which I have taken the above description. But even in these, owing to the half-rotten state of the few flowering spikelets remaining, I have been unable to ascertain precisely the real number of the hypogynous scales, which as in *Mapania* and *Lepironia*, are probably like the bristles of *Scirpus* more numerous than the stamens.

12. LEPIRONIA, Rich.

(Chondrachne, R. Br.)

Spikelet solitary, lateral, with numerous hermaphrodite flowers. Glumes closely imbricate all round the rhachis, concealing the floral scales, a few of the lowest empty. Flowers flat. Hypogynous scales numerous, 2 outer ones (bracteoles?) placed right and left, complicate, the keel ciliate, the others narrow, flat or nearly so, closely packed in several rows. Stamens 8 or more, alternating with the inner or opposite the outer scales. Style central, with 2 filiform stigmatic branches. Nut flat, not ribbed.—Stems from a creeping rhizome rush-like, transversely septate inside, leafless except sheathing scales. Spikelet oblique at the base of a terete involucre bract continuing the stem.

The genus is limited to the single Australian species, which extends over the Malayan Archipelago, parts of East India and Madagascar. The other species referred to the genus by Miquel belong to *Mapania* (*Pandanophyllum*) as now constituted, which differs in habit and in the reduced number of hypogynous scales and stamens.

1. ***L. mucronata*, Rich. in Pers. Syn. i. 70.**—Rhizome creeping. Stems 2 to 3 ft. high, varying from 1 to 3 lines in thickness, rigid, terete, marked by internal transverse septa giving it an articulate appearance, enclosed at the base by a few long loose sheathing scales, otherwise leafless. Spikelet apparently lateral, in the axil of an erect terete involucre bract strictly continuous with the stem and not dilated at the base, the spikelet varying from shortly ovoid or almost globular and $\frac{1}{2}$ in. long to oblong-fusiform and above $1\frac{1}{2}$ in. long, from rather pale brown to almost black and shining. Glumes exceedingly numerous,







very closely imbricate in spiral rows, broad almost orbicular, obtuse, membranous or rigid, completely concealing the floral scales, 3, 4 or sometimes more of the lower ones empty and shorter. Flowers very flat, the anthers and style-branches only shortly protruding from under the glumes. Hypogynous scales usually about 16 (said to be 8 only in some extra-Australian specimens), the two outer complicate ones or bracteoles with a ciliate keel, the others linear or oblong-linear, shorter than the glume. Stamens 8 or more, alternating with the inner scales or opposite the outer ones, apparently variable in number. Style glabrous. Nut flat, broadly ovate or almost orbicular, rounded at the end or almost acute, smooth or nearly so, without the longitudinal ribs of *Chorisandra*.—Kunth, Enum. ii. 366; Miq. Ill. Fl. Archip. Ind. t. 20; F. Muell. Fragm. ix. 17; *Chondrachne articulata*, R. Br. Prod. 220.

Queensland. East Coast, R. Brown; Moreton Bay and environs, M'Gillivray, F. Mueller, Leichhardt, Bailey.

N. S. Wales. Port Jackson, R. Brown; Richmond River, Mrs. Hodgkinson.

Some of the Australian specimens are remarkable for their very large almost black shining spikelet, in others it is light brown and shorter as in the majority of Asiatic specimens. They bear at first sight a striking resemblance to the Restiaceæ genus *Ecdiocola*, in which however, besides the internal structure, the spikelet is more strictly terminal and erect.

13. CHORISANDRA, R. Br.

Spikelets (or heads) solitary, lateral, with numerous hermaphrodite flowers (or androgynous spikelets). Glumes loosely imbricate all round the rhachis, not longer than the floral scales, a few of the lowest empty. Flowers flat or terete. Hypogynous scales numerous, the 2 outer ones (bracteoles?) placed right and left, complicate, the keel ciliate, the others narrow, flat or nearly so and closely packed in several rows or all spatulate or oblong and flat or concave. Stamens 6 to 12 or more, alternating with the inner or opposite the outer scales. Style central, deeply divided into 2 stigmatic branches. Nut biconvex or ovoid-globular, with about 8 prominent longitudinal ribs.—Stems from a creeping rhizome rush-like, transversely septate inside or continuous. Leaves few at the base of the stem, long terete and stem-like, or all reduced to sheathing scales. Spikelet globular or ovoid.

The genus is endemic in Australia with the exception of one species which extends to New Caledonia. The typical section is closely allied to *Lepironia* with which Endlicher proposed to unite it. The essential structure of the spikelet is the same as well as the general habit and inflorescence, the only difference being in the looser imbrication of the glumes of the globular spikelet, the flowers not quite so flat and the scales showing above or on a level with the glume, giving the spikelet the appearance of a globular head of numerous small spikelets. This appearance is still more striking in the section *Cymbaria* in which the 2 outer scales are scarcely different from the others and the structure might in some measure justify those who consider the spikelet as a head, the flowers as spikelets and the scales as glumes of which the majority have each a stamen in their axil the inner ones empty, and the central pistil without any subtending glume. But the explanation of the structure

as above given seems more in accordance with analogy. The two sections are certainly very closely connected, and pass gradually through *Lepironia*, *Scirpodendron*, *Mapania* and *Diplasia*, into *Hypolytrum*.

SECT. I. **Euchorisandra**.—*Spikelet globular, sessile, the base of the involucrel bract not at all or scarcely dilated. Two outer hypogynous scales complicate and keeled.*

- | | |
|---|--------------------------------|
| Stems transversely septate. Glumes acuminate-acute almost aristate. Eastern species | 1. <i>C. sphærocephala</i> . |
| Stems continuous, slender. Glumes acute. Southern species east and west | 2. <i>C. enodis</i> . |
| Stems transversely septate. Glumes obtuse. Western species | 3. <i>C. multiarticulata</i> . |

SECT. II. **Cymbaria**.—*Spikelet ovoid-globular, half-immersed in the dilated base of the involucrel bract. Hypogynous scales all oblong-spathulate and slightly concave.*

- | | |
|---|-------------------------|
| Stems transversely septate. Glumes obtuse | 4. <i>C. cymbaria</i> . |
|---|-------------------------|

SECTION I. **EUCHORISANDRA**.—Spikelets globular, sessile, the base of the involucrel bract not at all or scarcely dilated. Two outer floral scales complicate and keeled.

1. **C. sphærocephala**, *R. Br. Prod.* 221.—Stems from a short rhizome $1\frac{1}{2}$ to 2 ft. high or more, marked inside by transverse septa giving it an articulate appearance. Leaves few, erect, rigid and stem-like, shorter than the stem, with long open sheaths. Bract terminating the stem and continuous with it, without any basal dilatation. Spikelet globose, sessile, 4 to 5 lines diameter when fully out, almost black. Glumes very numerous, a few outer empty ones short broad and obtuse, the flowering ones lanceolate or ovate-lanceolate, acute and mostly aristate with short fine points giving the spikelet an echinate or hirsute aspect. Flowers flat. Hypogynous scales nearly as long as the glumes, 2 outer ones complicate with acute ciliate keels, the other 12 to 16 somewhat spathulate at the base, very dark at the end, acuminate almost aristate, not keeled but the margins slightly ciliate. Stamens few in the flowers examined, alternating with the inner scales. Nut broadly ovate, biconvex, with about 8 very prominent longitudinal ribs.—Böckel. in *Linnaea*, xxxvii. 142; F. Muell. *Fragm.* ix. 18.

Queensland. Moreton Bay, *C. Stuart*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *F. Mueller*, *C. Moore* and others; Hastings River, *Beckler*.

2. **C. enodis**, *Nees in Pl. Preiss.* ii. 73.—Stems from a creeping rhizome usually about 1 ft. high, rigid but much more slender than in *C. sphærocephala* and without any transverse septa. Leaves few, terete and stem-like, sometimes as long as the stem, the lower ones very short or reduced to loose open sheathing scales. Spikelet globular, sessile, about $\frac{1}{2}$ in. diameter when full grown, dark brown almost black, the bract terminating the stem not at all or scarcely dilated at the base. Glumes broadly ovate, acute or produced into a short point and slightly toothed at the end. Flowers flat. Hypogynous scales as long as the glumes, 2 outer ones broadly spathulate, complicate, the keel ciliate, usually 3-toothed with the central tooth mucronate or aristate; about 12 inner scales obovate-spathulate toothed and ciliate, the inner-

most narrow and more entire. Stamens about 12, alternating with the scales.—Hook. f. Fl. Tasm. ii. 84; F. Muell. Fragm. ix. 18.

Victoria. Hopkins River, *F. Mueller*.

Tasmania. Wet places near George-town, *Gunn*.

S. Australia. Lofty Range, *F. Mueller*; Port Lincoln, *S. M. Browne*.

W. Australia. King George's Sound and neighbourhood, *F. Mueller*; *Muir, Oldfield, Drummond*, n. 176; Swan River, *Preiss*, n. 1867, 1869; Port Gregory, *Oldfield*.

Boeckeler in *Linnæa*, xxxvii. 142, unites this with the *C. sphærocephala*, from which it differs in the slender continuous stems, the shape of the glumes, etc.

3. **C. multiarticulata**, *Nees in Ann. Nat. Hist. ser. 1, vi. 48*.—Stems from a thick creeping rhizome 1 to $1\frac{1}{2}$ ft. high, more or less marked with transverse septa, sometimes numerous and very prominent sometimes fewer and faint. Leaves few, one often as long as the stem, the others short or all reduced to loose open sheaths. Spikelets globular, sessile, the bract continuing the stem not at all or scarcely dilated at the base. Glumes very broad, the outer ones orbicular, very obtuse, entire or very slightly denticulate ciliate. Flowers flattened, but not so much as in *C. sphærocephala*. Hypogynous scales as long as the glume, 2 outer ones broadly spatulate, complicate, with ciliate keels; about 12 inner ones spatulate, entire or scarcely denticulate, the innermost narrower. Stamens about as many as scales and alternate with them.

W. Australia. Swan River, *Drummond*, 1st coll.; also n. 198 and 356.

SECTION II. CYMBARIA.—Spikelet ovoid-globular, half-immersed in the dilated base of the involucre bract. Floral scales all oblong-spatulate and slightly concave.

4. **C. cymbaria**, *R. Br. Prod. 221*.—Stems from a thick creeping rhizome 2 to 3 ft. high or even more, rigid, rush-like, more or less distinctly marked with transverse septa. Leaves few, erect, terete and stem-like, often longer than the stem, with long loose open sheaths or the lower ones reduced to sheathing scales. Spikelet ovoid or nearly globular, erect but half immersed in the dilated base of the erect involucre bract so as to appear adnate. Glumes very broad, obtuse, membranous. Flowers not flattened. Hypogynous scales about 15, rather longer than the glumes, imbricate, oblong-spatulate in the upper part, dark-coloured, somewhat concave, denticulate or jagged. Stamens about 12, alternating with the inner scales (or opposite the outer ones). Nut obovoid-globular $1\frac{1}{2}$ lines diameter, with about 8 very prominent longitudinal ribs.—*F. Muell. Fragm. ix. 18*.

Queensland. Brisbane River, Moreton Bay, *F. Mueller, Leichhardt, Bailey*.

N. S. Wales. Port Jackson, *R. Brown, Sieber*, n. 28, *Woolfs*; near Cape Howe, *F. Mueller*.

Victoria. Bunip and Tabernacle Creeks, Gipps' Land, *F. Mueller*.

W. Australia. *Drummond*, n. 383. These specimens are in fruit and the eastern ones I have seen are in flower only, but all appear to belong to one species, and the same or a very closely allied one is in the Isles of Pines, New Caledonia.

TRIBE III. RHYNCHOSPOREÆ.—Spikelets capitate spicate or paniculate, rarely solitary or umbellate, with 1 rarely 2 (in *Schoenus* 2 to 6) hermaphrodite fertile flowers and sometimes 1 or more male or sterile flowers above or below. Empty glumes at the base often more than 2. Hypogynous scales or bristles when present filiform or flat.

14. OREOBOLUS, R. Br.

Spikelet 1-flowered. Glumes 3, imbricate. Hypogynous scales (perianth-segments) 6, in 2 series but nearly equal. Stamens 3. Style slender, continuous with the ovary, not thickened at the base, deciduous, with 3 stigmatic branches. Nut ovoid, smooth. Dwarf much-branched plants forming dense cushion-like leafy tufts. Spikelets solitary in the upper axils or apparently terminal.

Besides the Australian species, which is also in New Zealand, there is one from Antarctic and Andine South America, closely allied to it.

1. *O. pumilio*, R. Br. *Prod.* 236.—Stems much branched, usually under $\frac{1}{2}$ in. long, in very dense cushion-like tufts of several in. diameter, but some barren branches lengthen out to 1 or 2 in. or in some New Zealand specimens to 3 or even 4 in., always completely covered by the imbricate leaf-sheaths. Leaves exactly distichous with equitant bases, or sometimes less regularly imbricate, erect or incurved, narrow, rigid, varying from $\frac{1}{2}$ in. to near 2 in. long, obtuse or almost acute, 3-nerved or smooth on the back, the short sheaths open. Spikelets 1 or 2 on the flowering branch, in one of the upper axils or at the end, each on a peduncle at first very short, but sometimes lengthening after flowering to $\frac{1}{2}$ in. Glumes narrow, erect, acute, the outer one leaflike, 3-nerved, ciliate on the midrib or keel, often 2 lines long, the second shorter, with the keel green but scarcely ciliate, the third still shorter but much longer than the ovary (and said to be sometimes deficient), and in some specimens all three glumes smooth and glabrous. Hypogynous scales or perianth-segments narrow-lanceolate, acute, all equal and about as long as the nut, and often persistent after it has fallen away. Nut ovoid-oblong, obtuse.—Kunth, *Enum.* ii. 367; Bœckel. in *Linnaea*, xxxviii. 230 (misspelt *Oreobolus*); Hook. f. *Fl. Tasm.* ii. 94; F. Muell. *Fragm.* ix. 20; *O. distichus*, F. Muell. in *Trans. Phil. Soc. Vict.* i. 109, and in Hook. *Kew Journ.* viii. 335; *O. pectinatus*, Hook. f. *Fl. Ant.* i. 87, t. 49.

Victoria. Summits of all the Alps from Mounts Baw-baw and Buller to Mount Kosciuszko, F. Mueller.

Tasmania. Table Mountain (Mount Wellington), R. Brown; summits of all the mountains at an elevation of 3000 to 5000 ft., J. D. Hooker.

This genus is always characterised after Brown as having two glumes with or without a single inner scale. In all the specimens I have examined from Tasmania, Victoria, New Zealand and South America, I have invariably found three glumes, all longer than the ovary and nut, the second exactly intermediate in size and aspect between the first and the third. The Andine species differs slightly from the Australian one in the leaves never distichous, with thicker broader sheathing bases, but in some of the specimens from Tasmania, as well as in some Victorian ones gathered







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by F. Mueller on the Bogang range the leaves are certainly not distichous, and these come very near to the American *O. obtusangula*, Gaudich. The hypogynous scales assume more the aspect of perianth-segments in this genus than in any other, and indeed closely resemble the perianths of *Juncus* or of *Restiaceæ*.

15. REMIREA, Aubl.

Spikelets small, densely capitate, with a single terminal hermaphrodite flower. Glumes 4, the 2 outer ones imbricate, the third larger, membranous, enveloping the fourth which is thick and fleshy, enclosing the flower. No hypogynous scales or bristles. Stamens 3. Style continuous with the ovary, not thickened at the base, deciduous; stigmatic branches usually 3, filiform. Nut closely enveloped in the inner 2 glumes, ovoid-triangular, often slightly compressed.—Low branching perennial. Leaves linear, with short imbricate sheathing bases. Spikelets very numerous, in ovoid sessile spikes solitary or clustered and surrounded by leafy involucre bracts.

The genus is limited to the single Australian species, which is dispersed along the sandy sea-coasts of most tropical countries.

1. *R. maritima*, Aubl. *Pl. Gui.* i. 45, t. 16, var. *pedunculata*.—Stems from a creeping and rooting base ascending or erect, much branched, a few inches high, completely covered with the imbricate bases of the leaves in the typical form, produced into a peduncle in the Australian variety. Leaves rigid, 1 to 3 in. long, $1\frac{1}{2}$ to 3 lines broad at the base, tapering into a point often pungent, dilated at the base into a short open sheath. Spikes ovoid, 4 to 6 lines long, solitary or more frequently several together sessile in a terminal head or cluster surrounded by 3 to 6 involucre bracts, the longest 1 to 2 in. long. Spikelets very numerous, terete, usually about 2 lines long, subtended by a glume-like bract. Lower glume short, the second longer, both broad and appressed but open longitudinally, the third 2 lines long, membranous, very broad but closely wrapped round the fourth or flowering glume, which is shorter and much thickened, becoming harder round the ripe nut.—Bœckel. in *Linnaea*, xxxv. 435; *R. pedunculata*, R. Br. *Prod.* 236, Kunth, *Enum.* ii. 139; F. Muell. *Fragm.* ix. 20.

Queensland. Abundant on the sandy sea-shores of the eastern coast, *R. Brown*, *A. Cunningham*, *Dallachy*.

In the typical American specimens, as in the majority of the African and some of the East Indian ones, the branches are leafy almost or quite up to the involucre bracts. In the Australian variety, which is common in the Malayan Archipelago and less developed in India, the peduncle is produced above the leaves to a length of from $\frac{1}{2}$ to 2 or even near 3 in., but there is no difference in the structure of the spikelets, and the Indian specimens distinguished by Nees under the name of *R. Wightiana*, Wall. are quite intermediate, the peduncle varying from a line or two to an inch in length. The genus, often placed next to *Kyllinga*, which it resembles in inflorescence, has been more appropriately removed by Bœckeler to the neighbourhood of *Rhynchospora* to which it is more nearly allied in the structure of the spikelets.

16. RHYNCHOSPORA, Vahl.

(Cephaloschoenus and Morisia, Nees.)

Spikelets capitate or paniculate, with 1 or 2 hermaphrodite flowers and often 1 or 2 males, oblong, more or less acuminate. Glumes imbricate all round the rhachis; 3, 4 or more outer ones shorter and empty, and 1 or 2 above the flowering ones enclosing male flowers or empty. Hypogynous bristles 6, rarely fewer, sometimes more. Stamens 3 or fewer. Style slender, conically dilated at the base; stigmatic branches 2. Nut globular or more or less flattened, crowned by the persistent conical or elongated base of the style, which is sessile and continuous or separated by a constriction but not distinctly articulate.—Stems simple under the inflorescence, usually leafy. Spikelets usually of a rich brown, more or less clustered, in terminal or axillary heads or corymbs sometimes forming large terminal panicles.

The genus is widely spread over the tropical and temperate regions of the New and the Old World. Of the five Australian species three have a very extended tropical range, two at least if not the third being common in America as well as in the Old World. The two others have not yet been identified with extra-Australian species.

Spikelets clustered in a compound panicle, the partial panicles corymbose or cymose.

Spikelets 3 to 4 lines long, very numerous, the terminal corymb 3 to 4 in. diameter. Beak of the nut long and thick, usually furrowed 1. *R. aurea*.

Spikelets 2 to 3 lines long, in loose corymbs of $\frac{1}{2}$ to 1 in. diameter. Beak of the nut not longer than the nut and closely sessile 2. *R. glauca*.

Spikelets in a single dense terminal head.

Hypogynous bristles shorter than the nut. Nut smooth, broadly obovoid, with a very short beak. Stem usually above 1 ft. 3. *R. Wallichiana*.

Three at least of the bristles much longer than the nut. Nut oblong. Stem usually under 1 ft.

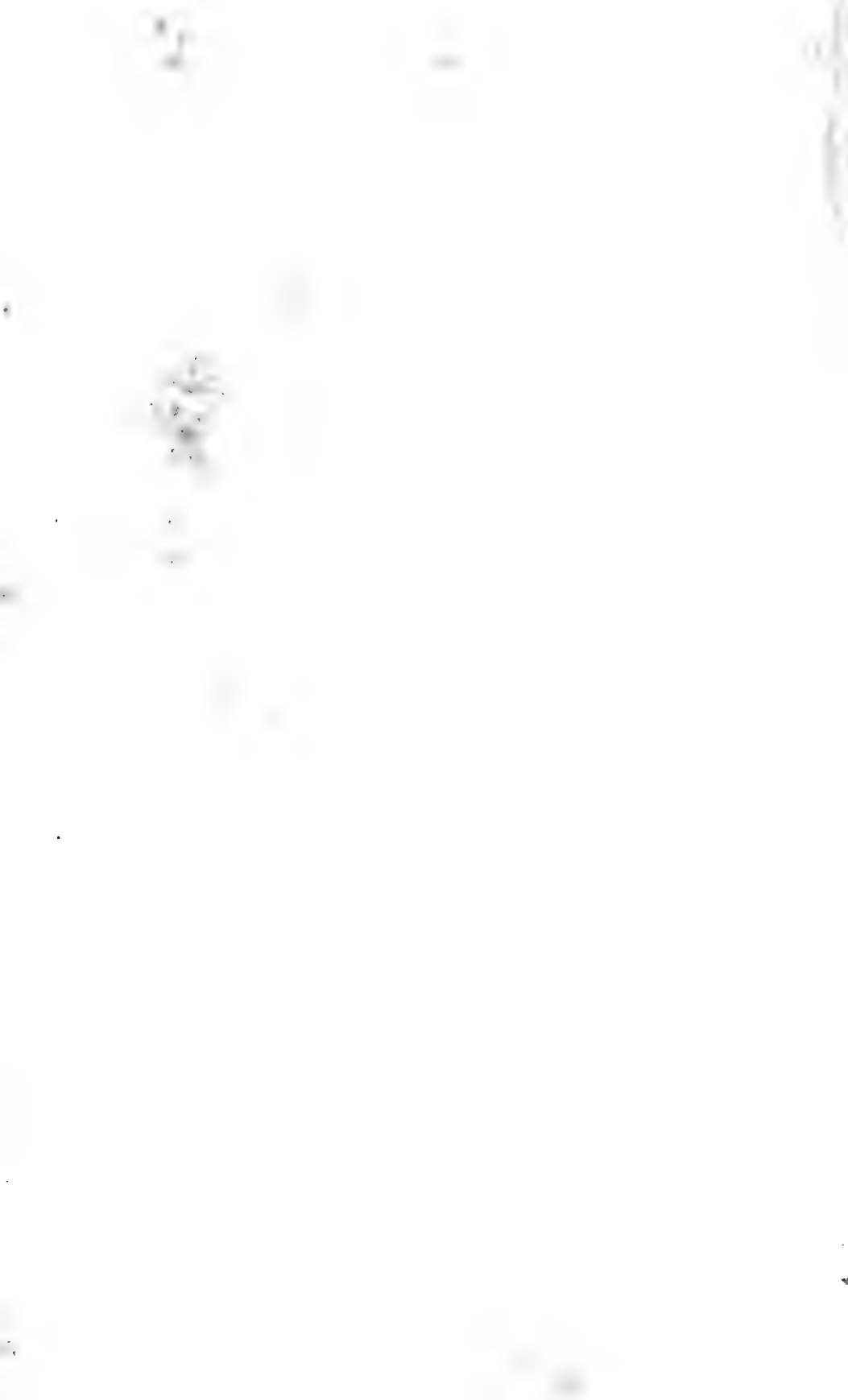
Spikelets 4 to 5 lines long. Nut tuberculate or hispid, the beak closely sessile and often as long as the nut. Leaves shorter than the stem 4. *R. longisetis*.

Spikelets about 3 lines. Nut smooth or nearly so, the beak short and constricted at the base. Leaves often as long as the stem 5. *R. tenuifolia*.

R. tenerrima, Nees in Spreng. Syst. Cur. Post. 26, correctly referred to the *R. setacea*, Boeckl. (*Schaenus setaceus*, Rottb. *Dichromena*, Kunth), was supposed to be Australian on the authority of Sieber's specimens, Agrostoth. n. 116, which are however evidently West Indian.

1. *R. aurea*, Vahl; Kunth, Enum. ii. 293.—Stems 2 to 3 ft. high, 3-angled, leafy throughout. Leaf-sheaths terminating in a short broad membranous ligula, the blade long, pointed, with scabrous edges. Spikelets very numerous, clustered in more or less corymbose panicles almost shortened into compound umbels, usually one large terminal one 3 to 4 in. diameter and 1 to 3 smaller axillary ones lower down the stem. Floral leaves or bracts usually longer than the inflorescence. Spikelets 3 to 4 lines long, with 1 perfect flower and 1 or 2 males.





Hypogynous bristles 6, usually longer than the nut but scarcely so long as the beak. Nut obovate, often scabrous, especially in the centre of each side, the beak sessile, as long as the beak or longer and as broad at the base, usually but perhaps not always furrowed on each side.—Bœckel. in Linnæa, xxxvii. 626: R. Br. Prod. 230; F. Muell. Fragm. ix. 17.

Queensland. Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*; Brisbane River, *Bailey*.

Widely spread over the tropical regions of the New and the Old World, and divided by Bœckeler and others into several species, the characters of which I have failed to appreciate.

2. **R. glauca**, *Vahl*; *Kunth, Enum.* ii. 297.—Stems angular and 1 to 2 ft. high or even more but slender. Leaves few narrow and distant, the radical ones sometimes as long as the stem. Spikelets not very numerous, clustered in small loose irregular corymbs $\frac{1}{2}$ to nearly 1 in. diameter, the terminal one more compound, with several small distant ones shortly pedunculate in the upper axils. Spikelets 2 to 3 lines long, with 1 or 2 hermaphrodite and 1 or 2 male flowers. Outer empty glumes 3 or 4, short. Hypogynous bristles 6 or 7, mostly rather longer than the nut. Nut obovate, marked with minute transverse wrinkles, the beak conical shorter than or nearly as long as the nut, sessile, not furrowed.—Bœckel. in Linnæa, xxxvii. 585; F. Muell. Fragm. ix. 17; *R. laxa*, R. Br. Prod. 230; *Kunth*, l. c. 298; *R. Brownii*, Rœm. et Schult. Syst. ii. 86; Bœckel. l. c. 581.

Queensland, Endeavour River, *Banks and Solander*; Brisbane River, Moreton Bay, *F. Mueller*.

N. S. Wales. Port Jackson, *R. Brown*; Hastings River, *Beckler*, New England, *C. Stuart*.

Extends over the tropical and subtropical regions of the New and the Old World. *Kunth* distinguished *R. glauca* and *R. laxa* chiefly as being the one American the other of the Old World. Bœckeler admits the two species as in both hemispheres, distinguishing them upon characters which are not very clear to me.

3. **R. Wallichiana**, *Kunth, Enum.* ii. 289.—Stems 1 to 2 ft. high, leafy at the base only. Leaves narrow, nearly as long as the stem or much shorter, the outer ones with open sheaths not ciliate, the inner one with a long close sheath. Spikelets numerous in a dense globular head. Involutural bracts spreading, the longest 2 to 3 in. long. Spikelets brown, $2\frac{1}{2}$ to 3 lines long, with 1 hermaphrodite and often 2 male flowers, and 3 or 4 outer empty glumes. Hypogynous bristles not so long as the nut and sometimes very short. Nut obovate-orbicular, smooth, the beak scarcely one third of its length.—Bœckel. in Linnæa, xxxvii. 542; F. Muell. Fragm. ix. 17: *Morisia Wallichii*, Nees; Hook. f. Fl. Tasm. Præf. 48.

N. Australia. Port Essington, *Armstrong*.

Queensland. Rockingham Bay, *Dallachy*; Wide Bay, *Bidwill*; Brisbane River, *Bailey*.

Extends over tropical Asia and Africa, and the same or a closely allied species is also in America.

4. *R. longisetis*, *R. Br. Prod.* 230.—Stems 6 in. to 1 ft. high. Leaves shorter, mostly at the base of the stem, narrow, with loose open ciliate sheaths, the inner one or two with close sheaths reaching sometimes halfway up the stem. Spikelets numerous, in a dense terminal globular head. Involucral bracts spreading or reflexed, the longest 2 to 4 in. long, linear, subulate-acuminate, dilated and ciliate at the base. Spikelets 4 to 5 lines long, acuminate, of a pale shining brown, 3 or 4 of the outer glumes shorter and empty. Hypogynous bristles 3 much longer than the nut and often as long as the glume, 3 or 2 much shorter. Nut oblong, biconvex, more or less tuberculate, the beak as long as or rather shorter than the nut and closely sessile upon it by its broad base.—Kunth, *Enum.* ii. 289; Bæckel. in *Linnaea*, xxxvii. 541; *R. pterochaeta*, *F. Muell. Fragm.* ix. 17.

N. Australia. Gulf of Carpentaria, mainland and Groote Island, *R. Brown*; Upper Victoria River, *F. Mueller*; between Norman and Gilbert Rivers, *Gulliver*.

Queensland. Rockingham Bay, *Dallachy*.

5. *R. tenuifolia*, *Benth.*—Very near *R. longisetis*, but with smaller spikelets and a different fruit. Stems slender, 6 to 8 in. high. Leaves numerous, very narrow and often longer than the stem, the outer ones with open sheaths scarcely ciliate, the inner sheaths longer and more closed. Inflorescence and involucral bracts as in *R. longisetis*, but the spikelets scarcely above 3 lines long when fully out. Hypogynous bristles 3 nearly as long as the glume, 3 scarcely longer than the nut. Nut oblong, slightly biconvex, bordered by a nerve-like margin, smooth or scarcely tuberculate, the beak not half so long and abruptly contracted at the base so as to appear stipitate.—*R. longisetis*, *F. Muell. Fragm.* ix. 17, not of *R. Br.*

N. Australia. Victoria River, *Elsey*.

Queensland. Rockingham Bay, *Dallachy*.

17. CYATHOCHÆTE, Nees.

(*Tetralapis*, *Steud.*)

Spikelets in a long narrow little-divided panicle, with 1 hermaphrodite fertile flower and a second male or sterile one below it. Glumes usually 4, imbricate all round the rachis, the 2 outer ones empty, the 2 inner longer, broad, and closely enveloping the flowers. Hypogynous bristles usually 4, long rigid and acute. Stamens usually 2. Style long, thickened towards the base, long persistent; stigmatic branches usually 2, filiform. Nut where known oblong, resting on a thick gynophore, not ribbed, crowned at first by the thickened base of the style, which may be at length deciduous.—Stems from a perennial rhizome usually tall, leafy chiefly at the base, the few stem-leaves passing into the leafy bracts. Spikelets narrow. Flowers here and there but rarely 3-merous. Styles and stamens sometimes very long.

The genus is endemic in Australia and though technically allied to *Carpha* and *Mesomelana* it is widely different in habit. Nees in characterising the genus in Pl. Preiss. ii. 86, refers to it as published in the Linnæa, ix. 300, n. 71; but that is a mistake, as he there only establishes the S. African genus *Cyathocoma*, which he subsequently referred to as allied to *Cyathochaeta*.

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| Stems 6 to 8 ft. Spikelets nearly 2 in. long, 1 or 2 in each sheath. Western species | 1. <i>C. clandestina</i> . |
| Stems about 2 ft. Spikelets $\frac{3}{4}$ to 1 in. long, few in each sheath. Western species | 2. <i>C. avenacea</i> . |
| Stems about 2 ft. Spikelets about $\frac{1}{2}$ in. long, several in each sheath. Eastern species. | 3. <i>C. diandra</i> . |

1. ***C. clandestina*, Benth.**—Stems terete, attaining 7 or 8 ft. Leaves crowded at the base, often above 1 ft. long, with distichous sheaths of 2 to 3 in., crowned at the orifice by a brown lacerated membrane, the lamina erect and rigid, 1 line broad in the upper part; a few leaves on the stems with long sheaths and short laminæ. Floral sheathing bracts long and loose with short laminæ along the upper part of the stem, the uppermost gradually shorter with short points. Spikelets usually 2 within each sheath and scarcely protruding from it or 1 on a longer peduncle, each one nearly 2 in. long, narrow and scarcely flattened. Glumes about 4, not distichous, the 2 outer empty ones shorter. Hypogynous bristles 4, rigid, shorter than the glumes, ciliate almost plumose below the middle. Stamens 2, the filaments 1 in. longer than the glumes and the anthers another inch long. Style as long, with 2 stigmatic branches. Nut oblong, crowned by the hardened base of the style, but not seen fully formed.—*Carpha clandestina*, R. Br. Prod. 231; *Rhynchospora clandestina*, Spreng. Syst. i. 194; *Chaetospora clandestina*, F. Muell. Fragm. ix. 40.

W. Australia. King George's Sound, *R. Brown*; Wilson's Inlet, *Oldfield*.

2. ***C. avenacea*, Benth.**—Stems rigid, attaining 2 ft. or more, terete below the inflorescence. Leaves at the base of the stem shorter, erect, very narrow, with incurved or involute margins ending in long linear points, the sheaths open without any membrane. Panicle long and very narrow, the branches or peduncles few, long and erect, generally 2 or 3 together in each bract. Lower floral bracts with long sheaths open some way down, the lamina flatter than in the radical leaves but very narrow, the upper ones gradually shorter. Spikelets few on each peduncle and often solitary, $\frac{3}{4}$ to 1 in. long, pale coloured, very narrow and acuminate. Glumes 4, not distichous, acuminate or the lower one aristate, the 2 outer empty ones shorter. Hypogynous bristles in the hermaphrodite flower not very long, ciliate at the base and none in the lower barren flower in the 2 spikelets examined. Stamens 2, and style 2-branched, all very much longer than the glume; anthers not seen. Nut long and narrow, grooved along one side and crowned by the hardened base of the style but not seen ripe.—*Carpha avenacea*, R. Br. Prod. 230; *Rhynchospora avenacea*, Spreng. Syst. i. 197; *Cyathochaeta diandra*, Nees in Pl. Preiss. ii. 86, as to Preiss's plant but not the

synonym; *Tetralepis australis*, Steud. Syn. Glum. ii. 159; *Chaetospora avenacea*, F. Muell. Fragm. ix. 40.

W. Australia. King George's Sound and neighbouring districts, *R. Brown*, *Oldfield*, *Drummond*, n. 367, *Muir*; Swan River, *Miss Lukin*, (the flowers very young but apparently the same), *Preiss*, n. 1836. I have not seen these specimens of *Preiss*'s, but *Nees*' description applies clearly to the Western *C. avenacea*, and not to the Port Jackson *C. diandra*.

3. ***C. diandra***, *Nees* in *Pl. Preiss*. ii. 86 (as to *Brown*'s synonym but not the plant described).—Stems slender, terete or nearly so, above 2 ft. long. Lower leaves not seen; upper ones with long half-open sheaths and long very narrow concave or angular laminæ ending in long points. Panicle often 1 ft. long, looser than in *C. avenacea*, with slender erect compound branches, the lower bracts leaflike, the upper ones small. Spikelets rather numerous on the branches, very narrow, acute, of a rich brown, about $\frac{1}{2}$ in. long. Glumes flowers and young nuts as in *C. avenacea*, except that there appears to be occasionally though very rarely a third stamen and a fifth or even a sixth hypogynous bristle.—*Carpha diandra*, *R. Br.* 'Prod. 231; *Rhynchospora diandra*, *Spreng.* Syst. i. 197; *Chaetospora diandra*, *F. Muell.* Fragm. ix. 39.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolfs*, *Mrs. Calvert*.

18. SCHÆNUS, Linn.

(*Chaetospora* *R. Br.* *Isoschœnus* and *Helothrix*, *Nees*. *Gymnochœta*, *Steud.*)

Spikelets variously capitate paniculate or solitary, with 2 or more (rarely 6) flowers, all hermaphrodite and fertile or the uppermost sterile. Glumes distichous, several outer ones or sometimes only 2 or 1 empty, the rhachis very short and straight between the empty glumes, more or less elongated and curved between the flowering glumes and flexuose, the flowers seated in the alternate notches, and the rhachis shortly produced above the last flower bearing a small empty glume. Hypogynous bristles or sometimes scales 6, or few and unequal, or none, often ciliate at or near the base, rarely much longer than the nut. Stamens 3 or very rarely 4 to 6 or only 1. Style slender or rarely slightly thickened towards the base, deciduous; stigmatic branches 3, filiform, sometimes almost plumose. Nut obovoid ovoid or rarely oblong or globular, more or less distinctly 3-angled or 3-ribbed, smooth reticulate foveolate or tuberculate.—Usually perennials, the stems often rigid and leafless below the inflorescence. Leaves either radical or at the base of the stem, narrow or subulate or reduced to the brown sheaths, or in a few species the stem leafy, either tall and rigid or short and weak or filiform and floating. Spikelets when capitate in sessile clusters within the head, the clusters and spikelets subtended by glume-like bracts, and the outer bracts of the head forming an involucre with or without leaflike laminæ; when paniculate the peduncles spikelets or branches of the panicle clustered within

sheathing bracts, with or without leaflike laminæ, the lower ones usually distant. Glumes frequently dark-coloured or black.

The genus is almost limited to the Old World and is chiefly Australian, but represented by a few species in the temperate regions of the northern hemisphere, in extra-tropical South America, in South Africa and New Zealand, and one in the Malayan Archipelago. Of the fifty-five Australian species three are also in New Zealand and one of them in South America; the remainder are as far as known all endemic.

I have found it impossible to maintain the distinction between *Schænus* and *Chaetopora* founded on the absence or presence of the hypogynous bristles, for still more than in *Scirpus*, there are several species where they are quite inconstant, and in many cases two very closely allied species would have to be placed in different genera. The flexuose rhachis, always produced beyond the fertile flower or flowers which are seated in the notches thus formed, appears to me to be a more constant character. In this respect and in the frequent concurrence of the upper flowering glumes forming a wing on each side of the rhachis, *Schænus* approaches the sections *Diclidium* and *Mariscus* of *Cyperus*, differing chiefly in the inflorescence, the brown or black more membranous glumes, the more numerous distichous empty ones and the few flowering ones less distinctly distichous, the frequent presence of bristles, etc., no one of these characters being constant although one or the other of them prevalent, so that difficult as it is to assign special distinctive characters the two genera appear never to have been confounded.

Numerous as are the Australian species of *Schænus*, I have been unable to divide them into distinct sections founded on any essential character. The variations in the number of glumes, in the hypogynous bristles, in the number of stamens, in the nuts, etc., are specific only, and I have felt obliged to arrange the species into series only, derived chiefly from inflorescence.

SERIES I. Macrocephalæ.—*Spikelets narrow, 5 to 6 lines long, sessile in a single oblong or ovoid terminal head with erect involucrel bracts. Hypogynous bristles present. Leaves tufted at the base of the stem. Western species.*

- | | |
|---|---------------------------|
| Outer bract broad and black at the base. Glumes glabrous,
2 outer empty ones. Hypogynous bristles slender . . . | 1. <i>S. cruentus</i> . |
| Outer bract brown and rather narrow at the base. Glumes
glabrous, 1 outer empty one. Hypogynous bristles
short, ciliate | 2. <i>S. compressus</i> . |
| Outer bract narrow. Glumes woolly on the edge, about
4 outer empty ones. Hypogynous bristles longer than
the nut, plumose | 3. <i>S. lanatus</i> . |

SERIES II. Sphærocephalæ.—*Spikelets 1 to 3 lines long, very numerous and sessile in a globular or broadly turbinate head, with spreading subulate involucrel bracts. Hypogynous bristles rarely deficient. Leaves tufted at the base of the stem.*

Heads globular. Western species.

Spikelets about 3 lines. Glumes acute or aristate, 5 or
more outer empty ones. Leaves not above 2 or
3 in.

Spikelets black. Hypogynous bristles as long as the
nut, ciliate

Spikelets brown. Hypogynous bristles scarcely any,
or very small and fine

Spikelets about 2 lines. Glumes acute, only 1 or no outer
empty one. Hypogynous bristles none or very
minute. Leaves long and capillary

- | |
|----------------------------|
| 4. <i>S. curvifolius</i> . |
| 5. <i>S. subbulbosus</i> . |
| 6. <i>S. setifolius</i> . |

- Spikelets about 1 line. Glumes obtuse, 2 outer empty ones. Leaves few, erect, rigid. Hypogynous bristles as long as the nut or small 7. *S. Drummondii*.
 Heads broadly turbinate. Spikelets about 3 lines. Glumes acute, 3 or 4 outer empty ones. Hypogynous bristles as long as the nut. Leaves capillary. Eastern species 8. *S. turbinatus*.

SERIES III. *Isoschoenææ*.—Spikelets in a single terminal head but either few in the head sometimes only 2 or 3, or if numerous spreading or the head loose. Hypogynous bristles none except in *S. brevisetis*, and then very short.

- Spikelets above 3 lines long. Western species.
 Involucral bracts 2 or 3, subulate curved and longer than the head.
 Bract-sheaths densely bearded. Spikelets 2 to 4 in the head 9. *S. barbatus*.
 Bract-sheaths glabrous or nearly so. Spikelets 6 or more in the head 10. *S. flavus*.
 Involucral bracts short or only 1 exceeding the head and rigid.
 Leaf-sheaths bearded. Spikelets 5 or 6 lines, 2 to 4 in the head. Hypogynous bristles present but very short and ciliate 11. *S. brevisetis*.
 Leaf-sheaths crowned by a membrane, not bearded. Spikelets scarcely 4 lines, several in the head. No hypogynous bristles 12. *S. armeria*.
 Spikelets 3 lines or shorter. Involucral bracts short or only 1 exceeding the head. Eastern species.
 Leaf-sheaths not bearded, the points very short. Spikelets 2 lines. Stamens 4 to 6 13. *S. aphyllus*.
 Leaf-sheaths not bearded, the points or laminæ subulate. Spikelets 3 lines. Stamens 3 14. *S. imberbis*.
 Leaf-sheaths bearded, the subulate points short. Spikelets 3 lines. Stamens 3 15. *S. ericetorum*.

SERIES IV. *Laterales*.—Spikelets not above 2 lines long, in a single lateral head or cluster or rarely solitary, the erect involucral bract continuing the stem. Hypogynous bristles ciliate.

- Leaf-sheaths not bearded. Spikelets brown. Glumes obtuse. Bristles longer than the nut 16. *S. nitens*.
 Leaf-sheaths bearded. Spikelets black. Glumes very acute. Bristles very short 17. *S. cygneus*.

(The head of spikelets is also sometimes slightly oblique with an erect bract in 11. *S. brevisetis* and some others of the *Isoschoenææ*).

SERIES V. *Oligostachyæ*.—Dwarf plants, rarely above 6 in. Spikelets solitary or 2 rarely 3 or 4 together, all terminal and erect. Hypogynous bristles none or short. Western species.

- Stems under 2 in. Spikelets 2 to 3 lines. Stamens 3.
 Leaf-sheaths with very short points. Spikelets 1 or 2, two lines long. Involucral bract short. No hypogynous bristles 18. *S. minutulus*.
 Leaves subulate, as long as the stem. Spikelets 1 or 2, 2 lines long. Involucral bract long and subulate 19. *S. trachycarpus*.
 Leaves filiform, shorter than the stem. Spikelets 2 to 4, 3 lines long. Involucral bract short. Hypogynous bristles present 20. *S. nanus*.

- Stems 3 to 6 in. Spikelet solitary, brown, 4 lines long.
 Bract short. No hypogynous bristles. Stamens 4 to 6 21. *S. pleiostemoneus*.
 Stems under 1 in. Leaves and involucral bracts long.
 Spikelets 2, pale-coloured, 6 to 7 lines long. No hypogynous bristles. Stamens 3. 22. *S. breviculmis*.
 Stems 2 to 5 in. Leaf-sheaths bearded, with short laminæ.
 Spikelets solitary, about 5 lines. Hypogynous bristles present 23. *S. deformis*.
 Stems 6 to 9 in. Leaves short, often woolly. Spikelets solitary, 1 in. long. Bract short. Hypogynous bristles present 24. *S. unispiculatus*.
 Stems filiform 10. Leaf-sheaths with very short points.
 Spikelet solitary, 5 to 8 lines long. Hypogynous scales present 25. *S. tenuissimus*.

SERIES VI. **Strictæ**.—*Leaves usually long. Spikelets erect or on erect peduncles in a narrow panicle, sometimes shortened into a spike but the lower flowering sheaths often distant. No hypogynous bristles. Stamens 3. Species all Western except S. Moorci and S. villosus.*

- Spikelets 1 to 3 in each bract. Outer empty glume 1 or none. Leaves at the base of the stem.
 Stems 3 to 6 in. Leaves much shorter, obtuse, $\frac{1}{2}$ to 1 line broad, not ribbed. Spikelets 5 to 6 lines. 26. *S. obtusifolius*.
 Stems 6 to 12 in. Leaves rather long, with 2 or 3 prominent ribs on each side. Spikelets 5 to 6 lines 27. *S. grammatophyllus*.
 Stems 9 to 18 in. Leaves slender, subulate-acuminate. Spikelets 4 to 5 lines 28. *S. asperocarpus*.
 Stems 6 to 9 in. Leaves rather shorter, almost subulate, not ribbed. Spikelets 4 to 5 lines 29. *S. Moorci*.
 Spikelets many, clustered in the upper bracts. Outer empty glumes several.
 Leaves at the base of the stem. Spikelets 4 to 5 lines.
 Glumes woolly-ciliate 30. *S. villosus*.
 Stem tall, leafy. Spikelets 8 to 9 lines, glabrous 31. *S. grandiflorus*.

SERIES VII. **Calostachyæ**.—*Spikelets large (except in S. acuminatus), pedunculate in distant sheaths, solitary or very few in each sheath. Outer empty glumes numerous, regularly distichous. Stamens 3.*

- Spikelets 1 in. Glumes acute. Hypogynous bristles present. Sheathing bracts with leafless laminæ 32. *S. calostachyus*.
 Spikelets $\frac{3}{4}$ to 1 in. Glumes obtuse with gland-like tips.
 No hypogynous bristles. Sheathing bracts with very short obtuse points.
 Peduncles scabrous. Outer empty glumes 5 or 6.
 Eastern species 33. *S. scabripes*.
 Peduncles smooth. Outer empty glumes 10 to 12.
 Western species 34. *S. multiglumis*.
 Spikelets $\frac{1}{2}$ to $\frac{3}{4}$ in. Glumes acute. No hypogynous bristles. Sheathing bracts with short acute points 35. *S. efoliatus*.
 Spikelets under $\frac{1}{2}$ in. Glumes acute. No hypogynous bristles. Sheathing bracts with short points 36. *S. acuminatus*.

(See also 24. *S. unispiculatus*).

SERIES VIII. **Paniculatæ**.—*Spikelets under $\frac{1}{2}$ in. long, usually dark brown or black, often falcate, all pedunculate, either numerous in a panicle usually secund or rarely few in a terminal cluster.*

Panicle or cluster short and dense. Stems rushlike.

Leaf-sheaths at the base only with very short points.

Leaf-sheaths bearded at the orifice. Spikelets few, 5 to 6 lines long. Hypogynous bristles present 37. *S. pedicellatus*.

Leaf-sheaths bearded. Spikelets numerous, 4 to 5 lines long. No hypogynous bristles. 38. *S. fascicularis*.

Leaf-sheaths not bearded. Spikelets numerous, about 5 lines. No hypogynous bristles 39. *S. brevifolius*.

Panicle loose but narrow. Leaf-sheaths bearded, with short or subulate points. Hypogynous bristles none or fine and rare.

No leaf-sheaths between the basal and floral ones. Spikelets black, flat, 3 to 4 lines. Nut granular, tuberculate 40. *S. melanostachyus*.

Leaf-sheaths few on the stem, with short subulate points.

Spikelets brown, acute, scarcely flattened, 4 lines.

Nut smooth 41. *S. sparteus*.

Leaf-sheaths several, distant, with linear laminae.

Spikelets brown, scarcely flattened, about 5 lines 42. *S. vaginatus*.

Panicle loose and much branched with very numerous spikelets. Stem leafy, the lower leaves very long. No hypogynous bristles.

Leaves nearly 2 lines broad at the base, tapering into long points. Spikelets 4 to 6 lines 43. *S. falcatus*.

Leaves subulate from the base. Spikelets 2 lines 44. *S. punctatus*.

SERIES IX. *Laxe*—Spikelets under $\frac{1}{2}$ in. long, few on slender pedicels. Hypogynous bristles present. Leaves at the base of the stem very narrow or subulate. Western species.

Stems loosely hairy in the lower part. Spikelets dark-brown, about 3 lines long 45. *S. indutus*.

Stems glabrous. Spikelets black, very flat, 4 to 5 lines long 46. *S. bifidus*.

SERIES X. *Microcarpæ*—Spikelets small in a terminal loose cluster or irregular umbel or clustered in the axils of distant leafy bracts. Nuts (except in *S. fluitans*) very small and white. Small or slender and weak plants with flaccid leaves.

Spikelets black, in a terminal cluster or irregular umbel, with few axillary clusters lower down.

Hypogynous bristles present. Nut smooth or nearly so.

Eastern species 47. *S. Brownii*.

No hypogynous bristles. Nut smooth. Eastern species 15. *S. ericetorum*.

No hypogynous bristles. Nut deeply foveolate-reticulate. Western species 48. *S. odontocarpus*.

Spikelets pale-coloured, 2 to $3\frac{1}{2}$ lines long, very narrow, in distant clusters, the lower bracts leafy. Western species.

Hypogynous bristles ciliate, almost plumose 49. *S. humilis*.

Hypogynous bristles none or very rare and not ciliate 50. *S. sculptus*.

Spikelets 1 line long in the axils of distant leaves or leafy bracts. Hypogynous bristles present 51. *S. axillaris*.

Spikelets 2 to 5 lines long, very narrow, one terminal and usually 1 or 2 lower down.

Stems short and filiform. No hypogynous bristles.

Stamen 1 52. *S. tenellus*.

Stems long and floating. Stamens 3.

Hypogynous bristles ciliate, almost plumose. Western species 53. *S. natans*.

No hypogynous bristles. Eastern species. 54. *S. fluitans*.

SERIES I. MACROCEPHALÆ.—Spikelets narrow, 5 to 6 lines long, sessile in a simple oblong or ovoid terminal head, with erect involucral bracts. Hypogynous bristles present. Leaves tufted at the base of the stem.

1. **S. cruentus**, *Benth.*—Stems from a knotty almost bulbous base slender but rigid, 1 to 2 ft. high. Leaves at the base of the stem and much shorter, erect, almost subulate, rigid, somewhat angular, the sheaths open with scarious margins not ciliate. Flower-head ovoid-oblong, compact, black, about $\frac{3}{4}$ in. long. Involucral bracts with a broad black base enclosing the spikelets, the outer one with an erect rigid point or lamina of 1 to 3 in., the second with a short point, the inner ones gradually more glume-like. Spikelets numerous, about $\frac{1}{2}$ in. long, with 2 or 3 flowers. Glumes membranous at the base, rigid at the end and acuminate, not fringed, outer empty ones usually 2, the lowest shorter, and a narrow empty one at the end of the rhachis. Hypogynous bristles 6, slender, not much longer than the nut. Stamens 3. Nut not seen ripe.—*Chaetospora cruenta*, Nees in Pl. Preiss. ii. 85; Boeckel. in Linnæa, xxxviii. 293; F. Muell. Fragm. ix. 37.

W. Australia. King George's Sound and adjoining districts, *Preiss*, n. 1790, *Drummond*, n. 108, 253, *F. Muell.*

This species is the nearest approach to *Mesomelena* in aspect, but the flexuose rhachis, the bristles, the slender deciduous style, etc. are quite those of *Schænus* (*Chaetospora*).

2. **S. compressus**, *Benth.*—Stems from a tufted but not knotted base, 6 to 9 in. high, slender, somewhat flattened, striate. Leaves at the base of the stem much shorter, very narrow, almost subulate, the sheathing bases open, with more or less scarious margins. Flower-head ovoid-oblong, dark coloured, the outer involucral bract erect, produced into a subulate leafy point often flexuose and several inches long, the second with a short point, the inner ones more glume-like. Spikelets sessile and densely crowded, narrow-lanceolate, 6 to 8 lines long, with about 5 flowers. Glumes lanceolate, acutely acuminate, the outer ones gradually shorter but only 1 empty. Hypogynous bristles 6, ciliate especially towards the base, about as long as the nut. Stamens 3. Nut obovoid, very obtuse, rugose.—*Chaetospora compressa*, Nees in Pl. Preiss. ii. 85; Boeckel. in Linnæa, xxxviii. 291; F. Muell. Fragm. ix. 37.

W. Australia. Swan River, *Drummond*, 1st coll. and n. 906; *Preiss*, n. 1782.

3. **S. lanatus**, *Labill. Pl. Nov. Holl.* i. 19, t. 20.—Stems slender, 6 to 9 in. high. Leaves shorter, at the base of the stem, subulate, the sheaths bearded at the orifice with woolly hairs. Spikelets few, in an oblong terminal head or cluster, within black involucral bracts, the lowest and sometimes the next also produced into a long erect subulate lamina, the sheathing base woolly at the orifice. Spikelets narrow,

acute, 5 or 6 lines long, with 2 flowers. Glumes brown, woolly on the margins, the flowering ones obtuse, about 4 outer ones empty, gradually shorter and acuminate. Hypogynous bristles 6, longer than the nut, plumose with long hairs. Stamens 3. Nut ovoid, obtuse, but not seen ripe.—*Chaetospora lanata*, R. Br. Prod. 232; Nees in Pl. Preiss. ii. 84; F. Muell. Fragm. ix. 37.

W. Australia. King George's Sound, *R. Brown*; Swan River, *Drummond*, 1st coll., *Preiss*, n. 1792.

SERIES II. SPHÆROCEPHALÆ.—Spikelets 1 to 3 lines long, very numerous and sessile in a globular or broadly turbinate head, with spreading subulate involucre bracts. Hypogynous bristles rarely deficient. Leaves tufted at the base of the stem.

4. **S. curvifolius**, *Benth.*—Stems slender, terete, rarely above 1 ft. high. Leaves shorter, densely tufted at the base of the stem, subulate, often curved or flexuose, the sheathing base often bordered by a hyaline membrane. Flower-head globular, 4 to 6 lines diameter. Involucre bracts ovate or ovate-lanceolate, bordered by a hyaline membrane and the outer ones produced into spreading flexuose subulate laminae of $\frac{1}{2}$ to 1 in. Spikelets very numerous, about 3 lines long, dark brown or black, with 1 or 2 flowers. Flowering glumes lanceolate, acute, almost entirely membranous; outer empty glumes about 5, gradually shorter, more acute or aristate, and 1 or 2 lowest setaceous almost from the base. Hypogynous bristles 6, scarcely longer than the nut, flat and ciliate. Stamens 3. Nut obovoid, obtuse, tuberculate or hispid at the top.—*Chaetospora curvifolia*, R. Br. Prod. 232; Nees in Pl. Preiss. ii. 84; F. Muell. Fragm. ix. 36; *Chaetospora aurata*, Nees in Ann. Nat. Hist. ser. 1, vi. 49.

W. Australia. King George's Sound, *R. Brown*, *Oldfield*, *Maxwell*, *F. Mueller*. and thence to Swan River, *Drummond*, 1st coll. and n. 899, *Preiss*, n. 1773, 1777 and others.

5. **S. subbulbosus**, *Benth.*—Very much resembles *S. curvifolius*, but the stems are thickened and bulb-like at the base, the ligulae of the old sheaths usually split up into long shreds or filaments, and the setaceous laminae very short. Flower-heads globular, about $\frac{1}{2}$ in. diameter. Involucre bracts few, subulate, incurved or flexuose, shorter than in *S. curvifolius* and much less dilated at the base. Spikelets very numerous, brown, about 3 lines long, with usually 3 flowers. Empty glumes 5 or 6 or even more, the outer ones setaceous almost from the base. Hypogynous bristles exceedingly short or here and there 1 or 2 longer than the nut and sometimes entirely deficient. Stamens 3. Nut obovoid, prominently 3-ribbed, tuberculate-hispid.—*Chaetospora brevisetis*, F. Muell. Fragm. ix. 37, not of R. Br.; *Elynanthus capitatus*, Nees in Ann. Nat. Hist. ser. 1, vi. 48? from the character given.

W. Australia. Kalbarri River, *F. Mueller*; Forest Hill, *Muir*; Swan River, *Drummond*, 1st coll.; Busselton, *Fries*.

Var. *juncceus*. Stem above 1 ft. and often flattened. Leaves more rigid, without

any or scarcely any scarious margin, but the old sheaths often split into shreds. Glumes minutely ciliate, the outer ones sometimes pubescent, the inner more obtuse than in the typical form.—W. Australia, *Drummond*, 1st coll.

6. *S. setifolius*, Benth.—Stems filiform, striate, above 1 ft. long, Leaves numerous at the base of the stem and almost as long, capillary, shortly dilated into brown closely imbricate sheaths. Flower-head globular, 4 to 5 lines diameter. Involucral bracts 2 or 3, subulate, spreading, slightly dilated and striate at the base, the bracts within the head glume-like but rigid and striate. Spikelets very numerous, sessile, narrow, about 2 lines long, with 2 or 3 flowers. Glumes acute or mucronate, keeled, striate, dark brown, only one empty outer one or even all flowering. No hypogynous bristles. Stamens 3. Nut ovoid, prominently 3-angled, smooth.

W. Australia. King George's Sound, *Menzies* (*Herb. Hook.*)

7. *S. Drummondii*, Benth.—Stems slender, 1 to $1\frac{1}{2}$ ft. high. Leaves few, at the base of the stem, very much shorter, subulate, the sheaths glabrous. Flower-head globular, 3 to 4 lines diameter, and in one specimen a second head below the terminal one. Involucral bracts 2 or 3, subulate, spreading, sometimes very short, sometimes 1 to 3 in. long, slightly dilated at the base. Spikelets numerous, ovate, slightly compressed, a little more than 1 line long, with 2 flowers, but usually only 1 fertile. Glumes obtuse, 2 outer ones empty and shorter. Hypogynous bristles 6 or fewer, longer than the nut and ciliate with a few long hairs, or sometimes all very small. Stamens 3. Nut ovoid, prominently 3-angled, smooth and shining, at length very dark coloured or almost black.—*Chætospora nitens*, var. ? R. Br. *Herb.*; *C. microstachya*, Nees in *Pl. Preiss.* ii. 84; Bœckel. in *Linnæa*, xxxviii. 295; F. Muell. *Fragm.* ix. 37 (a name preoccupied in *Schœnus*); *Gymnochæte Drummondii*, Steud. *Syn. Glum.* ii. 156.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Drummond*, n. 114, 333, *F. Muell.*

The spikelets are nearly those of *S. nitens*, but much smaller, very much more numerous, in a terminal head with several bracts, not thrown to one side by the single bract.

8. *S. turbinatus*, Benth.—Stems slender, angular or compressed, rarely above 1 ft. high. Leaves at the base of the stem much shorter, subulate, the sheaths either scarious on the margin or at length split into filaments. Flower-head ovoid or turbinate, usually about $\frac{1}{2}$ in. long. Involucral bracts 3 or more, lanceolate at the base, with a subulate point or lamina, the longest often attaining 2 or 3 in. Spikelets numerous, sessile, linear-lanceolate, flattened, about 3 lines long, with 1 perfect flower. Glumes lanceolate, acutely acuminate, usually ciliate, 3 or 4 outer empty ones gradually shorter and more aristate, the empty glume above the flower stipitate. Hypogynous bristles 6, rigid, rather longer than the nut, ciliate especially below the middle. Stamens 3. Nut obovoid, prominently 3-ribbed, minutely granular,

rugose.—*Chaetospira turbinata*, R. Br. Prod. 232, Bæckel. in *Linnaea*, xxxviii. 293, F. Muell. Fragm. ix. 33; Sieb. *Agrostoth.* n. 31.

N. S. Wales. Port Jackson, *R. Brown*, *U. S. Exploring Expedition*, *F. Mueller*, and many others.

SERIES III. ISOSCHÆNÆ.—Spikelets in a single terminal head, but either few in the head, sometimes only 2 or 3, or if numerous spreading, or the head loose. Hypogynous bristles none or very short.—*Isoschænus*, Nees.

9. **S. barbatus**, Bæckel. in *Linnaea*, xxxviii. 277.—Very closely allied to *S. flavus*, and probably a variety only, the stems more slender, 2 to 6 in. high. Leaves subulate, densely bearded at the orifice of the sheath. Flower-heads narrower than in *S. flavus*, consisting usually of 2 to 4 spikelets, the broad base of the involucre bract densely bearded on the margin, the glumes slightly so.—F. Muell. Fragm. ix. 30; *Isoschænus barbatus*, Nees in *Pl. Preiss.* ii. 80.

W. Australia. Princess Royal Harbour, *Preiss.* n. 1732; Stirling Range, *F. Mueller*.

10. **S. flavus**, Bæckel. in *Linnaea*, xxxviii. 278.—Densely tufted. Stems rigid, under 6 in. high, minutely pubescent or rarely quite glabrous. Leaves at the base of the stem and often as long, very narrow or almost subulate, acute, rigid, flexuose, the sheaths bordered at the orifice by a hyaline membrane often slightly ciliate. Flower-head oblong or broad, with few or many spikelets. Involucre bracts 2 or 3 longer than the head, the short broad base bordered by a hyaline membrane, the leaflike lamina rigid but curved; inner bracts glumlike but mostly with a green keel. Spikelets lanceolate, brown, 4 to 5 lines long, more or less flattened, with about 3 flowers. Glumes thinly membranous, acute, 2 or 3 outer empty ones shorter. No hypogynous bristles. Stamens 3. Nut ovoid, 3-ribbed, tuberculate-rugose.—F. Muell. Fragm. ix. 30; *Isoschænus flavus*, Nees in *Ann. Nat. Hist.* ser. 1. vi. 49, and in *Pl. Preiss.* ii. 80; *Isoschænus Drummondii*, Steud. *Syn. Glum.* ii. 167.

W. Australia. Swan River, *Drummond* 1st coll. and n. 332, 898; *Preiss.* n. 1774.

11. **S. brevisetis**, Benth.—Stems 6 in. to near 1 ft. high. Leaves at the base of the stem 3 to 4 in. long, subulate, rigid, the black sheaths densely bearded at the orifice. Flower-head or cluster oblong, with 2 to 4 spikelets. Outer involucre bract erect, rigid, subulate, 1 to 2 in. long, the second short, the sheaths or dilated base bearded. Spikelets sessile, lanceolate, 5 to 6 lines long, with 2 flowers. Glumes rather obtuse or the outer ones acute or acuminate, woolly-ciliate on the margin, 5 or 6 outer empty ones gradually shorter. Hypogynous bristles much shorter than the nut and sometimes very minute, flat and ciliate at the base. Stamens 3. Nut obovoid, slightly 3-ribbed, smooth or nearly so.—*Chaetospira brevisetis*, R. Br. Prod. 232.

W. Australia. King George's Sound, *R. Brown*; Point Henry, *Oldfield*; Perongerup, *F. Mueller*.

Var. *subimberbis*. Glumes very slightly fringed or quite glabrous.—*Schaenus flaviculmis* (partly), Nees in Pl. Preiss. ii. 81; F. Muell. Fragm. ix. 30; *S. cygneus*, Nees, l. c., but not the *Chaetospira cygnea*, Nees, in Ann. Nat. Hist. ser. 1. vi. 49.—Swan River, Preiss, n. 1795: Drummond, n. 910, Miss Lukin.

Though sometimes this has almost the aspect of *S. pedicellatus*, it is readily distinguished by the spikelets closely sessile. In this and some other species the uppermost flowering glume and summit of the rhachis are often swollen into a globular densely villous mass, but perhaps through disease, as the enclosed nut is generally deformed.

12. **S. armeria**, Bæckel. in *Linnæa*, xxxviii. 279.—Stems densely tufted, slender, mostly 9 in. to 1 ft. high, leafless except 1 or 2 sheathing scales at the base with a short subulate lamina, the orifice of the sheath crowned by a brown or hyaline membrane. Flower-head or cluster about $\frac{1}{2}$ in. diameter, the bracts all short, or 1 or 2 outer ones produced into a point rather longer than the head. Spikelets rather numerous, sessile, narrow-lanceolate, slightly compressed, dark brown, 3 to 4 lines long, with 2 flowers. Glumes acute or the outer ones mucronate, glabrous or minutely pubescent, the margins not fringed, 3 or 4 outer empty ones gradually shorter. No hypogynous bristles. Stamens 3. Nut small, obovoid or almost globular, obscurely 3-angled scarcely rugose.—F. Muell. Fragm. ix. 30: *Isoschaenus armeria*, Nees in Ann. Nat. Hist. ser. 1. vi. 49 and in Pl. Preiss. ii. 80.

W. Australia. Swan River, Drummond, 1st coll. and n. 999, Darling Range, Preiss, n. 1755; Stirling Range, F. Mueller.

13. **S. aphyllus**, Bæckel. in *Linnæa*, xxxviii. 280.—Stems tufted, slender, 6 to 10 in. high, leafless except rigid brown sheathing scales at the base, glabrous at the orifice, and tapering into short erect points. Flower-head terminal or rarely slightly lateral. Involucral bracts shorter than the head or rarely 1 rather longer and erect. Spikelets rather numerous, brown, ovate-lanceolate, about 2 lines long, with 2 flowers. Glumes broad, acute, 3 or 4 outer ones empty and gradually shorter. No hypogynous bristles. Stamens 4 to 6 or very rarely 3. Nut obovoid, obtuse, obscurely 3-angled, smooth.—F. Muell. Fragm. ix. 28.

Victoria. On the Murray River, near the Golgol, F. Mueller. Very closely allied to *S. imberbis*, but more rigid, the sheathing scale at the base of the stem broader and deeply coloured, the spikelets more numerous in a denser though smaller head and not so black, the stamens almost always more than three.

14. **S. imberbis**, R. Br. Prod. 231.—Stems slender, densely tufted, 6 in. to above 1 ft. high, leafless except brown sheathing scales at the base, oblique at the orifice, glabrous or minutely ciliate and usually with a linear or subulate lamina of a few lines. Flower-head or cluster solitary, terminal or rarely slightly lateral, sometimes rather loose and about $\frac{1}{2}$ in. diameter. Involucral bracts shorter than the head or rarely one rather longer and erect. Spikelets 6 to 20 in the head, narrow-lanceolate, black, straight or slightly falcate, about 3 lines long,

with 2 flowers. Glumes obtuse or the outer ones acute, shortly ciliate towards the end or quite glabrous, 3 to 5 outer ones empty and gradually shorter. No hypogynous bristles. Stamens 3. Nut obovoid, very obtuse or retuse, obtusely 3-angled but scarcely ribbed, rugose.—F. Muell. Fragm. ix. 28; Sieb. Agrostoth. n. 30.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*; *Leichhardt*, *Woolfs* and others; southward to Illawarra, *A. Cunningham*, and granite rocks on the Wombayne River, *F. Mueller*.

15. *S. ericetorum*, R. Br. Prod. 231.—Closely resembles *S. imberbis* in every respect, except that the brown leaf-sheaths at the base of the stem are bearded at the orifice with short woolly hairs, the heads of spikelets rather looser sometimes forming a small corymb, with 1 or 2 lateral clusters on peduncles of 2 or 3 lines, but often quite as compact as in *S. imberbis*. Spikelets black, lanceolate, fully 3 lines long, rather more curved and acuminate than in *S. imberbis*, with 2 flowers as in that species, but the glumes often more numerous, 6 or 7 outer ones empty. No hypogynous bristles. Stamens and nut of *S. imberbis*.—Sieb. Agrostoth. n. 45; F. Muell. Fragm. ix. 28; Bœckel. in Linnæa, xxxviii. 278.

N. S. Wales. Port Jackson, *R. Brown*, *F. Mueller*, *C. Moore* and many others; Newcastle, *Leichhardt*.

W. Australian specimens from *Drummond* in herb. Hook. very much resemble the *S. ericetorum*, but the spikelets are in too imperfect a state to verify their structure.

SERIES IV. LATERALES.—Spikelets not above 2 lines long, in a single lateral head or cluster or rarely solitary, the erect involucrel bract continuing the stem. Hypogynous bristles present, ciliate.

Owing to the bract subtending the spikelet being readily taken for one of the glumes, the few empty glumes and the very broad flowering ones enveloping each other, they appear at first sight not to be distichous, but the flexuose zigzag rhachis with the centre of the scar of each glume regularly on alternate sides show that the arrangement is really that of other *Schæni*, and not imbricate all round as in *Scirpus*, to which Bœckeler has transferred the *S. nitens*.

16. *S. nitens*, Hook. f. Handb. N. Zeal. Fl. 299.—Stems from a creeping rhizome slender, from an inch or two to 1 ft. high. Leaves few at the base of the stem, short, terete but furrowed along the inner side, the sheaths not bearded. Involucrel bract erect, continuing the stem to $\frac{1}{2}$ to $1\frac{1}{2}$ in. beyond the inflorescence. Spikelets in a sessile cluster of 2 to 6 or solitary, apparently lateral, from ovoid to ovoid-lanceolate, $1\frac{1}{2}$ to 2 lines long, with 2 flowers and a normally flexuose rhachis. Glumes broad, obtuse, not so distinctly distichous as in most species though the insertion is really the same, 2 or rarely 3 outer empty ones shorter. Hypogynous bristles 6, rather longer than the nut, ciliate at the base with long hairs. Stamens 3. Nut ovoid, prominently 3-angled, smooth and shining.—*Chatospora nitens*, R. Br. Prod. 233, Hook. f. Fl. Tasm. ii. 82, F. Muell. Fragm. ix. 35; *Scirpus nitens*, Bœckel. in Linnæa, xxxvi. 696.

Queensland. Moreton Island, *M^cGillivray*.

Victoria. Maritime pastures from Melbourne to Gipps' Land, *F. Mueller*, *Adamson* and others.

Tasmania. Port Dalrymple and Kent's Group, Bass's Straits, *R. Brown*; sand hills, north coast, *Gunn* and others.

S. Australia. Port Lincoln, *R. Brown*; Spencer's Gulf, *F. Mueller*.

W. Australia. King George's Sound, *R. Brown*; also *Drummond*, n. 385.

The species is also in New Zealand, and apparently the same in extra-tropical South America.

17. **S. cygneus**, *Nees in Pl. Preiss.* ii. 81 (as to the syn.).—Stems very slender, 6 to 9 in. high. Leaves at the base of the stem short, subulate, the sheaths bearded at the orifice, the older outer ones dark brown and rigid. Involucral bract subulate, continuing the stem $\frac{1}{2}$ to $1\frac{1}{2}$ in. beyond the inflorescence. Spikelets 2 or 3 together or rarely solitary, sessile and apparently lateral, lanceolate, not much flattened, dark brown or black, $1\frac{1}{2}$ to 2 lines long, with usually 2 flowers. Glumes very acute or mucronate, scarcely fringed or quite glabrous, about 4 outer empty ones of which 2 or 3 short. Hypogynous bristles or scales 6, very short, flat, hyaline and deeply divided. Stamens 3. Nut obovoid, slightly 3-ribbed, smooth or nearly so.—*Bœckel. in Linnaea*, xxxviii. 276; *Chaetospira cygnea*, *Nees in Ann. Nat. Hist.* ser. 1, vi. 49, but not the plant described in *Pl. Preiss.* ii. 81.

W. Australia. Swan River, *Drummond*, 1st coll.

In this and some other species the small bristles deeply divided into or fringed by long cilia have been sometimes described as hairs on the torus.

SERIES V. OLIGOSTACHYÆ.—Dwarf plants or rarely above 6 in. Spikelets solitary or 2 very rarely 3 or 4 together, all terminal and erect. Hypogynous bristles none or when present some or all very short.

18. **S. minutulus**, *F. Muell. Fragm.* ix. 32.—A dwarf but densely tufted perennial. Stems rather rigid, 1 to 2 in. high, leafless except broad brown sheathing scales at the base, sometimes produced into a short subulate lamina. Spikelets terminal, erect, solitary or 2 together, the subtending bract with a leafy point shorter or longer than the spikelet, the spikelet scarcely 2 lines long, lanceolate, brown, with 2 flowers. Glumes obtuse or the inner ones membranous at the top, about 3 outer empty ones gradually shorter. No hypogynous bristles. Stamens 6 (or 3 only *F. Mueller*). Nut small, ovoid, obtuse, seated on a thick raised torus, minutely granular, but not seen quite ripe.

W. Australia. *Drummond*.

19. **S. trachycarpus**, *F. Muell. Fragm.* ix. 33.—A dwarf densely tufted perennial. Stems subulate, 2 to 3 in. high. Leaves at the base subulate and stemlike and often longer than the stem, with rather long sheaths. Spikelets terminal, erect, solitary or 2 together, sessile within 2 erect subulate leafy bracts, one of them often above 1 in. long, the other much shorter. Spikelet about 2 lines long, very flat, with 2 or 3 flowers. Glumes obtuse, dark brown with light-coloured or hyaline margins, about 4 outer empty ones gradually rather shorter. Bristles and stamens not seen. Nut ovoid, 3-angled, tubercular-rugose, seated on a short stipes.

W. Australia. *Drummond*, n. 336. The spikelets in *Drummond*'s specimens are either very young or old and injured, and some of the above characters may require modification from more perfect specimens.

20. **S. nanus**, *Benth.*—Dwarf and densely tufted but perhaps annual. Stems $\frac{3}{4}$ to $1\frac{1}{2}$ in. high. Leaves radical, filiform, shorter than the stem. Spikelets terminal, erect, 2 to 4 together, sessile or very shortly pedicellate between 2 involucral bracts, 1 often longer than the inflorescence. Spikelets narrow-lanceolate, flattened, 3 to $3\frac{1}{2}$ lines long, with 4 to 5 flowers. Outer glumes gradually shorter, but usually only the lowest one empty. Hypogynous bristles 6, shorter than the nut or 1 or 2 longer, very shortly ciliate, not plumose. Stamens 3. Nut obovoid-globular, the ribs scarcely prominent, obtuse, tubercular-rugose.—*Chætospora nana*, *Nees* in *Pl. Preiss.* ii. 85; *Bæckel.* in *Linnæa*, xxxviii. 298.

W. Australia. Mount Elphinstone, *Preiss*, n. 1753; N. of Stirling Range, *F. Mueller*.

21. **S. pleiostemoneus**, *F. Muell. Fragm.* ix. 52.—Stems filiform, 3 to 6 in. high, leafless except a brown slender sheath at the base, oblique at the orifice and tapering into a short erect point. Spikelet solitary, terminal, erect, the subtending bract glumelike but tapering into a short point, the spikelet lanceolate, flattened, about 4 lines long, with 3 or 4 flowers. Glumes membranous, brown, acute, 1 or sometimes 2 outer ones empty and shorter. No hypogynous bristles. Stamens 4 to 6. Nut small, obovoid, 3-ribbed, tubercular-rugose, but not seen quite ripe.

W. Australia. Putingup, north of Stirling Range, *Maxwell*.

22. **S. breviculmis**, *Benth.*—A dwarf densely tufted perennial. Stems when in flower shorter than the spikelets and rarely 1 in. long when in fruit. Leaves much longer, attaining 4 to 5 in., very narrow, flat or subulate, dilated at the base into a short open sheath, the outer leaves often reduced to linear acute scales. Spikelets 2 (sometimes 1 or 3?), erect, with 1 long leafy bract under the lower one and usually 2 under the upper one, the 2 spikelets close together, 6 to 7 lines long, with 3 to 5 flowers. Glumes narrow, thinly membranous almost hyaline, with a prominent acute keel, and no outer empty ones besides the subtending bract. No hypogynous bristles. Stamens 3, with long anthers. Nut nearly globular, slightly 3-angled, tuberculate and often minutely hispid.

W. Australia, *Drummond*.

23. **S. deformis**, *R. Br. Herb.*—Stems densely tufted, 2 to 5 in. long, mostly curved. Leaves at the base of the stem with sheaths densely bearded at the orifice and short subulate laminæ with fine recurved points. Spikelet solitary and terminal, erect and sessile within the sheath of an erect subulate small bract, dark brown, narrow-lanceo-

late, scarcely flattened, about 5 lines long, with 3 or 4 flowers. Glumes narrow, scarcely acute, slightly fringed with short hairs, the outer ones more acuminate but apparently only one empty. Hypogynous bristles 6, densely hairy. Stamens 3.—*Chætospora deformis*, R. Br. Prod. 232.

S. Australia. Memory Cove, *R. Brown*. The specimens are few and not in a satisfactory state, but certainly cannot be referred to any other known species.

24. S. unispiculatus, F. Muell. Herb.—Stems from 6 to 9 in. high, rather rigid and striate. Leaves at the base of the stem much shorter, rigid, striate, sometimes flat and nearly 1 line broad, sometimes almost subulate, the young ones often clothed with a loose cottony wool, the old ones or rarely all glabrous, the sheaths bearded at the orifice with rather long hairs. Spikelet solitary and terminal or rarely with a second lower down, erect, 1 in. long or rather more, linear-lanceolate, somewhat flattened, with 2 or 3 flowers. Sheathing bract at the base and sometimes the lower glumes produced into a short leaflike point or lamina. Glumes all obtuse or scarcely acute, fringed at the apex, 2 or rarely 3 outer ones empty and shorter. Hypogynous bristles few, sometimes 1 or 2 longer than the ovary and plumose, the others and sometimes all very short. Stamens 3. Nut obovoid, but not seen ripe.—*Chætospora deformis*, F. Muell. Fragm. ix. 39, not of R. Br.

W. Australia. Swan River, *Drummond*, 1st coll. and n. 895, 896.

25. S. tenuissimus, Benth.—Stems from a creeping rhizome very slender or filiform, from a few inches to 1 ft. high or rather more, slightly angular, leafless except sheathing scales at the base oblique at the orifice and produced into a very short point. Spikelets solitary and terminal, erect, linear-lanceolate, flat, 5 to 6 lines long in the southern specimens, 6 to 8 lines in the Port Jackson ones, with 1 perfect flower and a second sterile one or empty glume above it. Glumes obtuse, slightly scarious at the end, 3 or 4 outer empty ones gradually shorter, besides the still shorter subtending glume-like bract. Hypogynous scales 6, small at the time of flowering, longer and acuminate under the fruit. Stamens 3. Style distinctly thickened at the base but articulate on the nut and deciduous. Nut obovoid, obtuse, smooth.—*Chætospora tenuissima*, Hook. f. Fl. Tasm. ii. 81, t. 140 B; F. Muell. Fragm. ix. 33.

N. S. Wales. Port Jackson, *C. Moore*.

Victoria. Near Brighton, Mount Imlay and Wilson's Promontory, *F. Mueller*.

Tasmania. Moist sandy places near Hobarton, *Gunn*; South Port, *Story*; near Circular Head, *F. Mueller*.

The hypogynous scales are very nearly those of *Lepidosperma*, though not quite so thick, the other characters are entirely those of *Schæenus*. The rhachis of the spikelets as in the other species is short and thick between the empty glumes, which leave annual scars, much elongated and curved above the fertile flower, bearing at its extremity the terminal barren flower or empty glume.

SERIES VI. STRICTÆ.—Leaves usually long. Spikelets erect or on

erect peduncles, in a narrow almost spikelike panicle, the lower flowering sheaths often distant. No hypogynous bristles. Stamens 3.

26. **S. obtusifolius**, *Bæckel. in Linnæa*, xxxviii. 281.—Stems rigid, 3 to 6 in. high, slightly compressed. Leaves at the base of the stem much shorter, erect, rigid, obtuse, concave, $\frac{1}{2}$ to 1 line broad, not ribbed, the dark brown sheath bordered at the top by a hyaline membrane and not bearded. Panicle simple, narrow and spikelike, but interrupted. Outer bracts rather distant, with dark brown almost black sheaths, bordered upwards by a scarious membrane, the lower ones produced into a rigid leaflike obtuse lamina, the upper into a short point. Spikelets usually 2 in each bract, on unequal pedicels, very erect, narrow, flat, 5 to 6 lines long, brown, usually with 2 flowers. Glumes rigid, acute or almost obtuse, only 1 outer empty one rather shorter and more acute than the flowering ones. No hypogynous bristles. Stamens 3. Nut not seen ripe.—*F. Muell. Fragm. ix. 31*; *Elynanthus obtusifolius*, *Nees in Pl. Preiss. ii. 78*.

W. Australia. Princess Royal Harbour, *Preiss, n. 1824*; Upper Kalgan River, *F. Mueller*; between Esperance Bay and Fraser's Range, *Dempster*.

27. **S. grammatophyllus**, *F. Muell. Fragm. ix. 31*.—Stems 6 in. to 1 ft. high, slender but striate. Leaves at the base of the stem shorter, erect, rigid, flat, $\frac{1}{2}$ to $\frac{3}{4}$ line broad, with 2 or 3 prominent longitudinal ribs on each side, the sheaths bordered upwards by a hyaline membrane and slightly bearded at the orifice. Panicle simple, narrow and spikelike but interrupted at the base, 3 to 6 in. long. Outer bracts rather distant, with short dark brown or black sheaths, bordered upwards by a scarious or hyaline membrane and slightly bearded at the orifice, the lower ones produced into a leaflike lamina, the upper into a short point. Spikelets 2 in each sheath on unequal pedicels or rarely 2 on the longer pedicel, all very erect, narrow, 5 to 6 lines long, with 2 or 3 flowers. Glumes acutely acuminate, glabrous, only 1 outer empty one scarcely shorter. No hypogynous bristles. Stamens 3. Nut shortly obovoid, 3-angled, nearly smooth.

W. Australia, *Drummond, n. 85 and 94*.

28. **S. asperocarpus**, *F. Muell. Fragm. ix. 29*.—Stems slender, striate, 9 in. to $1\frac{1}{2}$ ft. high. Leaves at the base of the stem much shorter, terete and stemlike but dilated at the base into rather long sheaths. Panicle long and narrow, the branches few and erect, two or three together very unequal in the lower bracts. Lower bracts distant, subulate and leaflike with brown sheaths dilated and open upwards, the upper bracts reduced to the brown sheaths. Spikelets few on the branches, erect and sessile, narrow, slightly flattened, 4 to 5 lines long, with 3 or 4 flowers. Glumes narrow, rigid, acute or mucronate, with only one outer empty one rather shorter, or none besides the subtending bract. No hypogynous bristles. Stamens 3. Nut obovoid, prominently 3-ribbed and transversely tuberculate-rugose.

W. Australia, *Drummond 1st coll. and n. 913*.

29. **S. Moorei**, *Benth.*—Nearly allied to *S. villosus*, but the inflorescence not so dense and quite glabrous, and the glumes fewer. Stems slender, terete, striate, 6 to 9 in. long. Leaves at the base of the stem shorter, very narrow, almost subulate, the inner surface concave, not ribbed, the sheaths not bearded. Panicle narrow, almost spike-like, the spikelets very few in each sheath and nearly sessile, or in the lower sheath an erect peduncle or branch with 2 or three spikelets. Sheathing bracts distant, with long subulate laminæ. Spikelets at first about 4 lines long, but fully 5 when in fruit, with 2 to 4 flowers. Glumes almost obtuse, only 1 or 2 outer ones empty, shorter, and more acute. No hypogynous bristles. Stamens 3. Nut ovoid, faintly 3-ribbed.

N. S. Wales. Port Jackson, *C. Moore, Vicary.* The latter specimens just coming into flower have the glumes rather rigid and the outer ones almost black. In Moore's with old spikelets in fruit, the glumes are all very thin, pale, and almost hyaline, but both appear to belong to the same species. In a specimen from Herb. Mus. Par. in herb. DC. the inflorescence is almost contracted into a head, but it appears also to belong to the same species.

30. **S. villosus**, *R. Br. Prod.* 231.—Stems densely tufted, rigid, slightly angular, about 1 ft. high. Leaves at the base of the stem much shorter, very narrow but flat, rigid, prominently 2- or 3-nerved on each face, the black sheaths short and woolly at the orifice, and 1 or 2 stem-leaves with longer 3-nerved sheaths and shorter laminæ passing into the floral bracts. Spikelets in dense clusters or secondary spikes, the upper ones forming an oblong spike of 1 to $1\frac{1}{2}$ in., the lower ones in more distant axillary clusters or secondary spikes; the spikelets acuminate, 4 to 5 lines long, with 2 or 3 flowers. Glumes lanceolate, acute, densely bearded on the margin, 3 or 4 outer ones empty, shorter and more acuminate. No hypogynous bristles. Stamens 3. Nut not seen.—Bœckel. in *Linnaea*, xxxviii. 285; F. Muell. *Fragm.* ix. 28; *Chaetospira villosa*, Nees in *Sieb. Agrostoth.* n. 26.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Wools* and others.

31. **S. grandiflorus**, *F. Muell. Fragm.* ix. 30.—Stems from a short almost bulbous base, stout, leafy, 2 ft. high or more. Leaves much shorter, often 4 to 5 lines broad, tapering to a point, the lower ones with short sheaths open almost to the base, those on the stem with closed sheaths ending in a short broad membrane or ligula, the floral leaves or bracts gradually narrower and shorter. Panicle narrow, leafy, often above 1 ft. long, with rather numerous axillary clusters or short partial panicles. Spikelets narrow-lanceolate, flat, brown, 8 to 9 lines long, with 2 to 4 flowers. Glumes very acute, not fringed, 8 to 10 outer ones empty and gradually shorter. No hypogynous bristles. Stamens 3. Nut narrow-obovoid, obtuse, nearly 2 lines long, obscurely 3-ribbed, quite smooth.—*Elynanthus grandiflorus*, Nees in *Pl. Preiss.* ii. 78.

W. Australia. Swan River, *Drummond, 1st coll., Preiss.* n. 1781; Point Henry

and Murchison River, *Oldfield*; Lakes and swamps near Putingup, *F. Mueller*. The style and the nut, though large, are quite those of *Schænus* and not of *Elymanthus*; the spikelets are those of the *Calostachyæ*, but crowded in the axils of the floral leafy bracts.

SERIES VII. CALOSTACHYÆ.—Spikelets large (except in *S. acuminatus*), pedicellate in distant sheaths, solitary or very few in each sheath. Outer empty glumes usually numerous, regularly distichous. Stamens 3.

32. *S. calostachyus*, Benth.—Stems 1 to 2 ft. high or more, rigid. Leaves at the base of the stem long, rigid, very narrow, with a prominent keel and slightly scabrous margins, the open sheaths bordered by a hyaline membrane slightly ciliate at the top, and sometimes 1 or 2 leaves on the stem with longer closed sheaths and shorter lamina. Floral leaves or bracts similar, but gradually smaller and all very distant. Spikelets solitary or 2 in each sheath, on very unequal peduncles, and sometimes a second spikelet on one of the lower ones, the spikelets narrow-lanceolate, flat, dark brown in the typical form, about 1 in. long when fully out, with 3 to 5 flowers. Glumes acute, rigid, shortly ciliate on the edge, 4 to 6 outer ones empty and gradually shorter, the lowest very short. Hypogynous bristles 4 to 6, much shorter than the nut or 1 or 2 of them longer. Stamens 3. Nut narrow-ovoid, 3-angled, prominently tuberculate almost muricate.—*Chatospora calostachya*, R. Br. Prod. 233.

Queensland. Endeavour River, *Banks and Solander*; Moreton Island, *M'Gilivray*.

N. S. Wales. Hastings River, *Beckler*.

Var. *distans*. Leaves rather shorter and none on the stem below the floral ones. Spikelets paler coloured, but I can find no other difference.—*Chatospora distans*, *F. Muell.* Fragm. iv. 35.

W. Australia. Murchison River, *Oldfield*; Busselton, *Pries*.

33. *S. scabripes*, Benth.—Stems 2 ft. high or more, somewhat flattened and grooved, leafless except a few long distant brown sheaths shortly woolly at the orifice, with very short erect obtuse points. Flowering sheaths similar but shorter, all distant. Peduncles 2 or 3 from each sheath, slender but rigid and very scabrous, all erect with a single erect spikelet or one from the lowest bract elongated with 2 or 3 spikelets. Spikelets narrow, acuminate, slightly flattened, $\frac{3}{4}$ in. long or perhaps rather more when fully out, with 1 or 2 flowers. Flowering glume acuminate but rather obtuse, outer empty ones 5 or 6 gradually shorter, all obtuse with an obtuse glandlike point. No hypogynous bristles. Stamens 3, with very long anthers. Nut not seen.

Queensland. Moreton Island, *F. Mueller*. Evidently very near to *S. calostachyus* and *S. efoliatus*, but distinct from both. The spikelets are, however, scarcely fully developed in the specimens seen.

34. *S. multiglumis*, Benth.—Very near *S. efoliatus* and included

in it by *F. Mueller*, but the stems taller and stouter, attaining 3 to 4 ft. much compressed or grooved on one side, the sheathing scales at the base and the sheathing bracts with small obtuse points as in *S. scabripes*. Spikelets generally 2 only within the uppermost bract, and 2 in a sheathing bract much lower down, the peduncles unequal, slender, rigid but smooth. Spikelets narrow and acute, scarcely compressed, $\frac{3}{4}$ to 1 in. long though scarcely fully out, with 2 flowers. Glumes obtuse with short obtuse glandlike points as in *S. scabripes*, but about 10 to 12 outer ones empty and gradually shorter. No hypogynous bristles. Stamens 3. Nut not seen.

W. Australia. King George's Sound, *Oldfield*; Albany, *F. Mueller*.

35. *S. efoliatus*, *F. Muell. Fragm.* ix. 32.—Stems rather slender, rushlike, terete and slightly striate, 1 to 2 ft. high, leafless except the close-sheathing scales at the base with very short obtuse erect points, the sheathing floral bracts distant, narrow, with very short or without any points. Peduncles 2 or 3 together in each bract, long filiform and erect, sometimes very long, each with 1 or 2 spikelets. Spikelets all erect, very narrow lanceolate, acute, rather flat, 6 to 8 lines long, with usually 2 flowers. Glumes rigid, very acute, 5 or 6 outer empty ones gradually shorter, the lowest 2 very short. No hypogynous bristles. Stamens 3. Nut obovoid, obtusely 3-angled, smooth.

W. Australia. King George's Sound and Stirling Range, *F. Mueller*; Kalgan River, *Oldfield*.

36. *S. acuminatus*, *R. Br. Prod.* 231.—Stems slender, 1 to $1\frac{1}{2}$ ft. long, leafless except a few distant close sheaths along the stem with narrow-linear erect laminae of $\frac{1}{2}$ to 1 in., the basal sheaths with only very short points; the floral sheathing bracts similar, distant. Spikelets solitary or 2 together on unequal peduncles within the sheaths, lanceolate, acute, flat, 4 to 5 lines long, with usually 2 flowers. Glumes acute, with whitish margins, not ciliate, about 5 outer empty ones gradually shorter. No hypogynous bristles. Nut (a loose one in herb. Br.) obovoid-oblong, very obtuse, obtusely 3-angled at the base, quite smooth.

W. Australia. King George's Sound, *R. Brown*.

SERIES VIII. PANICULATÆ.—Spikelets under $\frac{1}{2}$ in. long, usually dark brown or black, often falcate, all pedunculate, either numerous in a panicle usually secund, or few in a terminal cluster.

37. *S. pedicellatus*, *Benth.*—Stems 1 to $1\frac{1}{2}$ ft. high, rigid but often slender, leafless except short brown or black sheaths at the base, bearded at the orifice, and often bearing a subulate or terete lamina of $\frac{1}{2}$ to 2 in. Spikelets few in a terminal cluster and frequently another cluster a little lower down, in the axils of very short bracts, all distinctly pedicellate, linear-lanceolate, often falcate, slightly compressed, dark brown, 5 to 6 lines long, with 3 to 6 flowers. Glumes ciliate on

the margins, about 5 outer empty ones gradually shorter. Hypogynous bristles 6 or fewer, very unequal, one frequently as long as the nut but mostly shorter, and sometimes all very minute. Stamens 3. Nut ovoid, about 1 line or longer, obtusely 3-angled, smooth.—*Chaetospora pedicellata*, R. Pr. Prod. 232; *Schænus fascicularis*, Nees in Pl. Preiss. ii. 82, but not the plant described in Ann. Nat. Hist. ser. 1, vi. 48.

W. Australia. King George's Sound, *R. Brown*; Swan River, *Preiss*, n. 1802, also *Drummond*, 1st coll. and n. 105, 911, 912.

This and the following two species appear to pass almost gradually into the *S. melanostachyus*, but can scarcely be united with it as varieties.

38. **S. fascicularis**, *Nees* in *Ann. Nat. Hist. ser. 1*, vi. 48, not of *Pl. Preiss*.—Stems $1\frac{1}{2}$ to 2 ft. high, terete or grooved on one side, leafless except the dark brown rigid shining sheaths at the base, of which the inner one is often 2 in. long, bearded at the orifice, and bearing an erect subulate point of 1 to 2 or rarely 3 lines. Panicle terminal, narrow, dense, turned to one side, 1 to 2 in. long. Spikelets clustered, but all or most of them very shortly pedicellate, narrow, mostly falcate, slightly compressed, dark brown, 4 to near 5 lines long, with 2 or 3 flowers. Glumes scarcely ciliate, 5 or 6 outer empty ones gradually shorter. Hypogynous bristles none or rarely 1 short one. Stamens 3. Nut not seen.

W. Australia. Swan River, *Drummond*, 1st. coll. and n. 110.

39. **S. brevifolius**, *R. Br. Prod.* 231.—Stems from a creeping rhizome rushlike, 1 to 2 ft. high or more, leafless except the brown sheathing scales at the base, the innermost with a rigid erect point or lamina rarely 1 in. long, the orifice not bearded. Panicle rather loose but very narrow, 3 to 6 in. long or more, the spikelets almost clustered on short peduncles, the lower clusters distant, or the panicle rather more compound with the lower branches elongated. Sheathing bracts tapering into short erect points or laminae. Spikelets linear-lanceolate, 5 lines long when full-grown, brown, not so much flattened as in *S. melanostachyus*, with 3 to 5 flowers. Glumes obtuse or nearly acute, 2 to 4 outer empty ones shorter and more obtuse. No hypogynous bristles. Stamens 3. Nut obovoid, scarcely rugose.—*F. Muell. Fragm.* x. 29; *Sieb. Agrostoth.* n. 7.

Queensland. Near Brisbane, *Bailey*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, *C. Moore*, and others; Hastings River, *Beckler*.

Victoria. Port Phillip, *Luchmann*; near Brighton, *F. Mueller*; French Island, *Beviridge*.

S. Australia. *S. brachyphyllus*, *F. Muell.*, from Mount Lofty Ranges, mentioned by *F. Muell. Fragm.* ix. 29, under *S. melanostachyus*, appears to me to be quite identical with *S. brevifolius*.

W. Australia. King George's Sound, *R. Brown*; Murchison River, *Oldfield*; also in *Drummond's* collection, n. 912.

40. **S. melanostachyus**, *R. Br. Prod.* 231.—Stems terete, usually

2 to 3 ft. high, but some specimens from various quarters marked as attaining 8 to 10 ft., leafless except a brown sheath at the base more or less bearded at the orifice, with a spreading obtuse rigid lamina of 1 to 3 lines. Panicle rather loose and often secund, oblong or thyrsoïd, 3 to 6 in. long, the lower branches rather long. Sheathing bracts short, woolly at the orifice, with a small reflexed obtuse lamina. Spikelets all pedicellate, rather numerous, black, linear-lanceolate, flat, usually about 3 lines long but sometimes 4 lines, often slightly falcate, with 1, 2, or sometimes 3 flowers. Flowering glumes obtuse, about 4 outer empty ones gradually shorter and more acute. Hypogynous bristles either none or few and very short and unequal, rarely 1 as long as the nut. Stamens 3 or rarely 4. Nut obovoid, 3-ribbed, granular-tuberculate.—Bœckel. in Linnæa, xxxviii. 284; F. Muell. Fragm. ix. 29; Nees in Sieb. Agrostoth. n. 3.

Queensland. Rockingham Bay, *Dallachy*; Wide Bay, *Leichhardt*; Brisbane River, *Bailey*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolfs*, and others; north of Bathurst, *A. Cunningham*; New England, *C. Stuart*.

W. Australia? Apparently the same species, King George's Sound, *A. Cunningham*, also *Drummond*, n. 111 and 368. These specimens may, however, be rather referrible to *S. fascicularis*. The whole group requires further study from the living plant or from specimens gathered in all the different stages of development of the flowers.

41. **S. sparteus**, *R. Br. Prod.* 231.—Stems very slender but rigid, 1 to 2 ft. long, leafless except the brown sheaths at the base bearded at the orifice, with a short recurved subulate point rarely lengthened into a lamina of 2 or 3 in., and occasionally 1 or 2 similar sheaths with short subulate laminæ higher up the stem. Panicle narrow, loose, 1 to 2 in. long, besides a flowering bract occasionally at some distance lower down. Bracts like the lower sheaths but gradually shorter. Spikelets few within each sheath, all pedicellate or 2 or 3 on a short branch in the lower sheaths, all narrow, very acute, not much flattened, dark brown, about 4 lines long, with about 3 flowers. Glumes acuminate or almost obtuse, fringed with woolly hairs or at length glabrous, 5 or 6 outer empty ones gradually shorter. No hypogynous bristles. Stamens 3. Nut ovoid or obovoid, obtusely 3-angled, obscurely striate or smooth.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Wednesday Island, Torres' Straits, *Moseley*, also *Armitage* without indication of the special station.

42. **S. vaginatus**, *F. Muell. Herb.*—Stems 1 to 2 ft. long (or more?) leafless except a few distant brown sheaths about $\frac{1}{2}$ in. long, bearded at the orifice and bearing usually an erect rigid narrow lamina of $\frac{1}{4}$ to $\frac{1}{2}$ in., or rarely the lower ones with a narrow-linear leaf of 2 to 3 in., the stem readily disarticulating within each sheath. Panicle narrow, the short erect branches clustered, the lowest sometimes above 1 in. long. Lower sheathing bracts like the sheaths on the stem, the upper ones

with very short points. Spikelets not numerous, all pedicellate but erect, dark brown, very narrow, slightly compressed, 4 to nearly 5 lines long, with about 3 flowers. Glumes acutely acuminate, glabrous or fringed with a few hairs, about 3 outer ones empty and gradually shorter. No hypogynous bristles. Stamens 3. Young nut obovoid, 3-angled.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*.

N. S. Wales. New England, *C. Stuart*; Beroa, Bunya district, *Leichhardt*.

43. ***S. falcatus***, *R. Br. Prod.* 232.—Stems 2 to 3 ft. high, striate, often more or less flattened. Leaves at the base of the stem with short open sheaths produced into a concave erect lamina, often 2 lines broad at the base, but ending in a long subulate point, 1 or 2 of the leaves 1 ft. long or more, the stem-leaves few, with brown or black closed sheaths and shorter laminae. Panicle long and very narrow, the branches clustered and erect, the lower ones often distant and elongated, the whole panicle above 1 ft., the sheathing bracts like the stem-leaves but gradually smaller. Spikelets numerous, all pedicellate, light brown, linear-lanceolate, falcate or rarely straight, flat, varying from 4 to 6 lines long with 3 to 6 or even more flowers. Glumes acute or the lower ones aristate, 2 or rarely 3 outer empty ones shorter. Hypogynous bristles none or very small, 1 rarely as long as the nut. Stamens 3. Nut obovoid, very obtuse, 3-ribbed, minutely striate or cancellate.—*F. Muell. Fragm.* ix. 29; *S. elatus*, *Bœckel. in Flora*, 1875, 117 (from the char. given).

W. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Fitzmaurice and Wentworth Rivers, *F. Mueller*.

Queensland. Burdekin River, *Armitage*; Bowen Downs, *Birch* (with remarkably large spikes); Mount Wheeler, *Thozet* (spikelets young with only 2 flowers as yet developed).

44. ***S. punctatus***, *R. Br. Prod.* 232.—Stems 2 ft. high or more, leafy. Lower leaves very long, floral bracts gradually shorter, all subulate-filiform almost from the sheath. Panicle 6 in. to 1 ft. long, leafy, slender and loose. Spikelets very numerous, all pedicellate, lanceolate, slightly falcate, more or less flattened, scarcely 2 lines long, rather pale brown, with 2 flowers. Glumes thinly membranous, rather obtuse, 2 outer empty ones shorter. No hypogynous bristles. Stamens 3. Nut ovoid-oblong, obtusely 3-angled, marked with impressed dots (*R. Brown*), not ripe in the spikelets examined.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

SERIES IX. LAXÆ.—Spikelets under $\frac{1}{2}$ in. long, few, on slender pedicels. Hypogynous bristles usually present. Leaves at the base of the stem very narrow or subulate.

45. ***S. indutus***, *F. Muell. Herb.*—Stems slender, attaining about 1 ft., at first clothed with long spreading hairs, but the older ones often glabrous. Leaves few at the base of the stem, almost subulate, 1 to 3

in. long, the outer one with a short open sheath, the inner sheath close and slightly membranous at the orifice. Panicle very loose, with few spikelets, all on long pedicels, solitary or clustered in the axils of short slender dark brown sheathing bracts. Spikelets dark brown, lanceolate, flattened, about 3 lines long, with 2 or 3 flowers. Glumes very acute or the inner ones obtuse, 4 to 6 outer empty ones gradually shorter with the points sometimes slightly spreading. Hypogynous bristles 6 or fewer, very irregular, 1 or 2 longer than the young nut, the others often very small. Stamens 3. Nut not seen ripe.

W. Australia, Drummond, *n.* 207, 382.

46. **S. bifidus**, Bæckel. in *Linnaea*, xxxviii. 282.—Stems slender, 6 to 9 in. high. Leaves rather numerous at the base of the stem and much shorter, subulate, flexuose, dilated at the base into narrow open sheaths. Panicle loose with few spikelets, the pedicels long and solitary or two together within distant leafy bracts, with black closed sheaths and subulate laminæ. Spikelets erect, black, lanceolate, much flattened, 4 to 5 lines long, with 2 or 3 flowers. Glumes obtuse, 4 or 5 outer empty ones gradually shorter. Hypogynous bristles 6 or fewer, very unequal, 2 or 3 longer than the nut, often dilated and paleaceous, entire or toothed, the others very small. Stamens 3. Nut obovoid-oblong, 1 line long, 3-ribbed, granular-tuberculate.—*Elynanthus bifidus*, Nees in *Ann. Nat. Hist.* ser. 1, vi. 48; *Chætospora oligostachya*, F. Muell. *Fragm.* ix. 38.

W. Australia, Drummond, 1st coll. also *n.* 342 and 900; King George's Sound, Muir.

The end of the rachis of the spikelet and terminal glume are often enlarged and densely villous as in *S. brevisetis*.

SERIES X. MICROCARPÆ.—Spikelets small, in a terminal loose cluster or irregular umbel or clustered in the axils of distant leafy bracts. Nuts, except in *S. fluitans*, very small and white. Small or slender and weak plants with flaccid leaves, the sheaths not bearded.

47. **S. Brownii**, Hook. f. *Handb. N. Zeal. Fl.* 298.—Stems tufted, slender, often filiform, from 2 or 3 in. to near 1 ft. high. Leaves narrow-linear or filiform, a few at the base of the stem with short points or laminæ, 1 to 3 higher up with closed sheaths and longer laminæ. Spikelets few together in clusters or little umbels, the clusters sessile or pedunculate, several from each sheath, the lower ones distant, the whole forming a narrow panicle or small irregular umbel, or reduced to 2 or 3 rather dense clusters. Bracts with brown sheaths and leafy points. Spikelets linear or linear-lanceolate, brown or black, 2 to near 3 lines long, usually with 2 flowers. Glumes acute or the inner ones obtuse, 3 or 4 outer ones empty of which the 2 outermost very much shorter, the keel often minutely ciliate. Hypogynous bristles 6, very slender, from a little to very much longer than the nut. Stamens 3. Nut small, white, 3-ribbed, minutely verticulate under a

lens.—*Chaetospora imberbis*, R. Br. Prod. 233; Bœckel. in Linnæa, xxxviii. 299; Sieb. Agrostoth. n. 27, Hook. f. Fl. Tasm. ii. 82, F. Muell. Fragm. ix. 35; *Isolepis margaritifera*, Nees in Herb. Berol.; *Scirpus margaritifera*, Bœckel. in Linnæa, xxxvi. 697; *Chaetospora tenuissima*, Steud. Syn. Glum. ii. 162, from the char. given, not of Hook. f.

Queensland. East Coast, *R. Brown*; Brisbane River, *F. Mueller*, *Bailey*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, and others.

Victoria. Very common from Port Phillip and Melbourne to Gipps' Land, *Robertson*, *F. Mueller* and others.

Tasmania. Very abundant throughout the island, *J. D. Hooker* and others; often much elongated with rather broader leaves when growing under water.

S. Australia. St. Vincent's Gulf to Murray River, *F. Mueller* and others.

The species is also in New Zealand.

48. **S. odontocarpus**, *F. Muell. Fragm.* ix. 32.—A small slender tufted plant, perhaps annual, closely allied to *S. Brownii*. Stems filiform, 1 to 4 in. high. Leaves at the base of the stem, much shorter, filiform, with narrow brown sheaths. Spikelets few together, in clusters or little umbels, the clusters generally 2 or 3 together, 1 sessile the others pedicellate at the summit of the stem or in the axil of a subulate leafy bract lower down. Spikelets narrow, dark brown, $1\frac{1}{2}$ to 2 lines long, with 2 or 3 flowers. Flowering glumes obtuse, not ciliate, 1 or 2 outer empty ones shorter and more acute. No hypogynous bristles. Stamens 3. Nut small, prominently 3-ribbed, the ribs often forming as many prominent angles or small teeth, deeply foveolate-reticulate between the ribs.

W. Australia, *Burges*; Champion Bay and Murchison River, *Oldfield*; Stirling Range, *F. Mueller*.

49. **S. humilis**, *Benth.*—A dwarf densely tufted plant, rarely above 4 in. high and sometimes not 1 in. Leaves at the base of the stem few, narrow, flaccid, with broad brown sheaths. Floral leaves or bracts several along the stem with short sheaths and linear laminae, varying from very short to longer than the inflorescence. Spikelets usually 2 to 4 together in short spikes in the axils of the lower bracts, solitary or 2 together in the upper ones, linear-lanceolate, green or brown, 2 to 3 lines long, with 4 or 5 flowers. Glumes membranous, sometimes thin and almost hyaline, sometimes brown, the outer ones gradually shorter but all enclosing flowers except the terminal one. Hypogynous bristles 6, usually rather longer than the nut and plumose. Stamens 3. Nut ovoid, prominently 3-angled, reticulate-cancellate between the angles and crowned by the conical continuous base of the style.

W. Australia. *Drummond*, n. 363; Kalgan, Tone and Vasse Rivers, *Oldfield*; north of Stirling Range, *F. Mueller*. Included by *F. Mueller* *Fragm.* ix. 38 in *Chaetospora nana* (*S. nanus*), but appears to me to be much nearer to *S. sculptus*, differing chiefly in the hypogynous bristles.

50. **S. sculptus**, *Bœckel. in Linnæa*, xxxviii. 286.—Tufted and perhaps annual, the stems slender, from a few inches to nearly 1 ft. long.

Leaves at the base of the stem few and very narrow, with brown sheaths. Floral leaves or bracts several along the stem with short sheaths and linear laminæ, varying from very short to 1 or 2 in. Spikelets several together in little clusters or short spikes in the axils of the floral leaves, or the upper ones sometimes solitary, linear, 3 to $3\frac{1}{2}$ lines long, with 3 to 6 flowers. Glumes membranous, brown or almost hyaline, narrow, the outer ones gradually shorter, but all enclosing flowers except the terminal one. Hypogynous bristles none or rarely 2 or 3 very slender and not plumose. Stamens 3. Nut ovoid, prominently 3-ribbed, deeply pitted or cancellate or at length quite smooth.—F. Muell. Fragm. ix. 30; *Elynanthus sculptus*, Nees in Pl. Preiss. ii. 79.

W. Australia. Swan River, *Drummond*, 1st coll. n. 915 or 916, *Preiss*, n. 1863, 1745. The latter has more the habit but not the plumose bristles of *S. humilis*.

51. **S. axillaris**, *Hook. f. Handb. N. Zeal. Fl.* 298.—Stems very slender and weak, leafy, diffuse or creeping, 2 to 6 in. long, often very intricate. Leaves or leafy bracts flat and flaccid but very narrow or almost filiform, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long. Spikelets usually 2 or 3 together, sessile or shortly pedicellate in the axils of the leaves or leafy bracts, about 1 line long, somewhat flattened, with 1 perfect flower. Glumes obtuse, glabrous, brown with green keels, 2 or rarely 3 outer empty ones shorter. Hypogynous bristles 6 or sometimes fewer, about as long as the nut. Stamens 3. Nut small, obovoid, white or ash-coloured, 3-ribbed, smooth or minutely reticulate.—*Chaetospora axillaris*, R. Br. Prod. 233; *Hook. f. Fl. Tasm.* ii. 82; *Fl. Nov. Zel.* t. 62; *Bæckel.* in *Linnaea*, xxxviii. 289; F. Muell. Fragm. ix. 34; *Helothrix pusilla*, Nees in *Ann. Nat. Hist.* ser. 1, vi. 45.

N. S. Wales. Nepean River, *R. Brown*.

Victoria. Marshes, Snowy River, *F. Mueller*; Grampians, *Sullivan*.

Tasmania. Marshy places near Penquite, *Gunn*; Southport, *C. Stuart*.

S. Australia. Cataracts of Lofty Range, *F. Mueller*.

W. Australia, *Drummond*.

The species is also in New Zealand.

52. **S. tenellus**, *Benth.*—A dwarf tufted plant, the filiform stems 1 to 2 in. high in our specimens. Leaves nearly as long, capillary, flaccid, with membranous glabrous sheaths. Spikelets 1 terminal and 1 or 2 at some distance lower down, in short narrow sheathing bracts, all very narrow-linear, about 2 lines long, with 2 or 3 flowers. Glumes very narrow, membranous, pale-coloured, rather acute, 1 or 2 outer empty ones shorter and more acuminate. No hypogynous bristles. Stamen 1. Style very slender. Nut obovoid-oblong, but not ripe in our specimens.

W. Australia. *Drummond*, n. 927. Evidently allied to *S. fluitans*, but different in habit, and the stamen appears to be always solitary.

53. **S. natans**, *Benth.*—Stems submerged, capillary, branched and

leafy, forming floating masses often above 1 ft. long, the leaves as well as the branches more slender than in *S. fluitans*. Spikelets solitary and terminal or with another lower down the branch or peduncle, light brown, very narrow linear, 2 lines long, with 2 flowers. Glumes narrow, almost obtuse, one outer empty one rather shorter. Hypogynous bristles 6 or fewer, rather longer than the nut, ciliate almost plumose. Stamens 3. Nut small, ovoid, prominently 3-ribbed, smooth but sometimes tipped with a minute pubescent point.—*Chaetospora natans*, F. Muell. Fragm. ix. 38.

W. Australia. *Drummond*.

54. **S. fluitans**, *Hook. f. Fl. Tasm.* ii. 81. t. 141 B.—Stems usually submerged, slender and weak, branched, leafy, forming short dense tufts in shallow stagnant water, or intricate floating masses 1 to 2 ft. long in running water. Leaves filiform, 1 to 3 in. long, the sheaths sometimes with a small membrane at the orifice. Spikelets solitary or rarely 2 or 3 distant ones at the end of the branches, the upper bract almost glumelike, the lower more leaflike, the spikelet very narrow linear, 4 to 5 lines long, with 2 to 4 flowers. Glumes narrow, rather obtuse, only one or sometimes no empty one besides the subtending bract. No hypogynous bristles. Stamens 3. Style sometimes long-persistent but always falling off from the ripe nut as in the rest of the genus. Nut ovoid, nearly 1 line long, prominently 3-ribbed, smooth but often tipped by a minute pubescent point.—F. Muell. Fragm. ix. 28.

Tasmania. South Esk River, *Gunn*.

19. ELYNANTHUS, Nees.

Spikelets clustered in a narrow panicle, with usually 2 hermaphrodite flowers close together on a short not flexuose rhachis, both fertile or one sterile. Glumes distichous, 2 to 4 outer ones empty and a small empty one close above the flowers. No hypogynous bristles. Stamens 3 to 8. Style slender, with a thickened hard persistent base continuous with the ovary; stigmatic branches 3 or 4, filiform. Nut ovoid, crowned by the hard ovoid or oblong persistent base of the style, sometimes as big as itself and either continuous with it or slightly contracted under it. Perennials with the habit of the narrow paniculate *Schæni*.

Besides the two Australian species which are endemic, the genus includes several from South Africa, the characters of some of which however require revision. The spikelets are nearly those of *Schænus*, but without the elongated flexuose rhachis, and the style and nut are almost as in *Cautis*.

Spikelets about 6 lines long, densely clustered or almost
spicate in the axils of leafy bracts. Stamens 6 to 8 . . . 1. *E. octandrus*.

Spikelets $1\frac{1}{2}$ to 2 lines long, few together in the axils of the
sheathing bracts. Stamens 3. 2. *E. capillaceus*.

E. revolutus, Nees in Pl. Preiss. ii. 78, from Swan River, *Preiss*, n. 1769, is un-



known to me but probably not a congener. It is described as having linear-filiform leaves with *revolute* margins. Spikelets in a terminal irregularly decompound cluster, with 2 or 3 involucre bracts 3 to 6 in. long. Glumes 7, 3 or 4 outer empty ones oblong-lanceolate acuminate, uppermost 1 or 2 also empty but small and narrow, the intermediate ones floriferous. Stamens 8 or 9. Style bulbous at the base, 3-cleft.

1. **E. octandrus**, *Nees in Ann. Nat. Hist. ser. 1, vi. 48, and in Pl. Preiss. ii. 77.*—Stems from a thick bulblike base 1 to 2 ft. high, angular, leafy. Leaves flat but narrow, rigid, tapering into long subulate points, the radical ones with short open sheaths, those on the stem few, distant, with long close sheaths, passing into the floral bracts. Spikelets in dense clusters or oblong heads of $\frac{1}{2}$ in. or more, several together shortly pedunculate or sessile in the lower bracts, the upper ones forming an interrupted spike, the floral leaves or bracts like the stem-leaves but with gradually shortened subulate laminae or points. Spikelets very narrow, about 6 lines long. Glumes dark brown or black with light-coloured margins, lanceolate, very acutely acuminate, 2 or 3 outer empty ones shorter and broader. Flowers both hermaphrodite but only one fertile. Stamens 6 to 8. Style-branches (always?) 4. Nut ovoid, 4-ribbed, smooth, crowned as in *Cladium mariscus* by the thick base of the style, continuous with it but solid and nearly as long as the endocarp below it.—*Schænus octandrus*, F. Muell. *Fragm. ix. 31.*

W. Australia. King George's Sound to Swan River, F. Mueller, Muir, Drummond, 1st coll., *Preiss. n. 1770, 1771, Oldfield* and others.

2. **E. capillaceus**, *Benth.*—Stems filiform, $\frac{3}{4}$ to $1\frac{1}{2}$ ft. long, leafless except a rather long sheath at the base, either truncate or with a setaceous lamina or point. Panicle small and narrow, the spikelets 3 or 4 together in the axil of the lower sheathing bract, 1 or 2 in the upper ones, the bracts with short subulate points. Spikelets very narrow, $1\frac{1}{2}$ to 2 lines long. Glumes acute or acuminate, 3 or 4 outer empty ones rather shorter. Flowers usually only one fertile. Stamens 3. Nut ovoid, crowned by the ovoid persistent base of the style as long as itself as in *Caustis*.—*Chaetospora capillacea*, Hook. f. *Fl. Tasm. ii. 81, t. 141 A*; *C. capillaris*, F. Muell. *Fragm. ix. 34.*

Victoria. Curdie's Inlet, Walter; base of Mount Abrupt, Sullivan.

Tasmania. Hospital Bay, South Huon River, Oldfield; Southport, C. Stuart; Bay of Fires, Bissil.

W. Australia? Point Henry, Oldfield. Possibly some error in the label.

On examining more than a dozen spikelets from different specimens I have been unable to detect any trace of the 3 hypogynous scales figured in the plate, which must be very exceptional or perhaps some mistake of the artist.

20. MESOMELÆNA, Nees.

(*Gymnoschænus*, Nees.)

Spikelets numerous in a dense head enclosed within the sheaths of the involucre bracts, with 2 flowers, the upper one fertile, the lower

sterile or male, (or 1 only, the lower one deficient in *M. deusta*), the rhachis short. Glumes distichous or nearly so, 2 to 4 outer ones empty, the flowering ones closely enveloping the flowers. Hypogynous bristles or scales 3, often flat. Stamens 3. Style thickened and rigid in the lower part but at length usually deciduous; stigmatic branches 3. Nut obovoid, crowned when young by the hardened base of the style, inserted on a raised torus or a short thick stipes.—Densely tufted rigid perennials. Leaves at the base of the stem only, often long, or rarely 1 on the stem. Flower-head solitary and terminal, the enclosing bracts broad and rigid often black, one usually and sometimes 2 or more with linear points or laminæ.

The genus is limited to Australia. It is well characterised by the inflorescence as well as by the hypogynous bristles or scales constantly 3 only and all equal.

Flower-heads ovoid or oblong, or turbinate-globose, black. Hypogynous bristles or scales rigid, longer than the nut.

Heads under $\frac{1}{2}$ in. Outer glumes aristate with recurved points

1. *M. stygia*.

Heads above $\frac{1}{2}$ in. Leafy points of the bracts erect. Spikelets 6 to 8 lines long

2. *M. deusta*.

Heads above $\frac{1}{2}$ in. Bracts very broad with long rigid spreading leafy points. Spikelets 4 to 5 lines long

3. *M. tetragona*.

Flower-heads globular, very compound. Spikelets 2 to 3 lines long. Hypogynous bristles short and slender.

Outer bracts orbicular or very broad, with short or without any points. Eastern species

4. *M. sphærocephala*.

Outer bracts ovate, one or more with long leafy points.

Western species

5. *M. anceps*.

1. *M. stygia*, Nees in *Pl. Preiss.* ii. 89.—Stems slender, terete, rigid, 6 in. to 1 ft. high. Leaves at the base only, the sheaths rigid, 1 to $1\frac{1}{2}$ in. long, the lamina nearly as long, subulate, bordered at the base by a hyaline membrane. Flower-head ovoid or turbinate-globose, erect or oblique, quite black, 3 to 6 lines diameter. Two outer bracts black with scarious hyaline margins, the outermost one usually with a rigid erect green-pointed lamina of 1 in. or more and apparently continuing the stem, the second bract without any or only a very short point. Spikelets numerous, sessile, 3 to 4 lines long. Flowers 2, both hermaphrodite and close together, the outermost usually sterile. Glumes scarcely distichous, about 5 empty, the outer ones short but aristate, the fine black points recurved when dry, the inner ones acuminate with short points, the flowering ones broader and more membranous. Hypogynous bristles or rather scales 3, flat, paleaceous, very acute and brown at the end, sometimes much dilated at the base and sometimes with a tooth on each side of the central point. Stamens 3. Style hard and thicker at the base but deciduous. Nut obovoid, very obtuse, smooth, seated on a raised torus or short thick stipes slightly dilated and lobed under the nut.—*Chaetospora stygia*, R. Br. Prod. 233;

F. Muell. Fragm. ix. 36; *Mesomelæna Preissii*, Nees, in Pl. Preiss. ii. 88; *Lepidosperma uncinatum*, Nees, l. c. ii. 93.

W. Australia. King George's Sound, *R. Brown* and others, and thence to Swan River, *Drummond* 1st. coll. and n. 251, 894, *Preiss*, n. 1760, 1761, 1777, 1786, 1791; *Murchison* River, *Oldfield*.

The northern specimens are generally taller and stouter than those from King George's Sound, the spikelets often 4 lines long, the glumes sometimes with broad hyaline margins. The laminæ of the outer bracts very variable.

2. **M. deusta**, *Benth.*—Stems densely tufted on a horizontal rhizome, rigid, 6 in. to 1 ft. high. Leaves much shorter, all radical with open sheaths or one embracing the stem with a longer close sheath. Flower-head ovoid or turbinate, $\frac{1}{2}$ to $\frac{3}{4}$ in. long; outer bracts 2, erect, the sheaths as long as the spikelets, black and rigid with scarious hyaline margins, and erect leafy points, $\frac{1}{2}$ to 1 in. long on the outer bract shorter on the second, the bracts within the head more glume-like. Spikelets numerous, sessile, 6 to 8 lines long, very narrow, 1-flowered, dark-coloured. Glumes not strictly distichous, 4 or 5 empty ones nearly of the same length, the pubescent keels ending in short points, rather longer and more obtuse on the outer ones, the inner ones with membranous sides, the flowering glume thin and hyaline, and above the flower an empty glume more like the outer ones but smaller. Hypogynous bristles 3, nearly as long as the glumes, ciliate in the lower part. Stamens 3. Style long, rigid at the base. Nut not seen ripe but the enlarged ovary oblong, tapering into the continuous style.—*Carpha deusta*, *R. Br.* Prod. 230; *Bœckel.* in *Linnaea*, xxxviii. 269; *Chætospora deusta*, *F. Muell.* Fragm. ix. 39; *Rhynchospora deusta*, *Spreng.* Syst. i. 195; *Desvauria aristata*, *Nees* in *Sieb.* Agrostoth. n. 25.

Queensland. Brisbane River, *Bailey*.

N. S. Wales. Port Jackson, *R. Brown*, *A. Cunningham* and many others; New England, *C. Stuart*, *C. Moore*; Beronda Station, *Leichhardt*.

3. **M. tetragona**, *F. Muell.* Fragm. ix. 36.—Stems from a thick rhizome rigid, angular or flattened, $1\frac{1}{2}$ to 2 ft. high. Leaves radical, rather long, erect, rigid, not above 1 line broad, the sheathing base brown and membranous on the margin, and often one leaf on the stem with a long closed sheath and shorter erect lamina. Flower-head turbinate-globose, usually nodding, $\frac{1}{2}$ to 1 in. broad. Involucral bracts 3 or 4, very broad, coriaceous, black, closely embracing the spikelets, and as long as them, the outer 2 or 3 produced into long rigid leafy laminæ, the lowest sometimes 8 to 10 in. long, and several of the bracts within the head often protruding short linear points or laminæ. Spikelets numerous, 4 to 5 lines long, narrow-lanceolate, slightly flattened, with 2 flowers close together, the lowest male, the upper one hermaphrodite. Glumes obscurely distichous, 1 or 2 outer empty ones tapering to rigid dark-coloured points, the sides broadly membranous closely enveloping each other, the outer flowering one brown in the centre with broad almost hyaline margins closely wrapped round the flowers, the inner glume round the fertile flower exceedingly thin.

Hypogynous bristles 3. Stamens 3 with long anthers. Style hardened at the base but at length deciduous. Nut ovoid, obtuse, smooth and shining, nearly 2 lines long.—*Chætospora tetragona*, R. Br. Prod. 233; Nees in Pl. Preiss. ii. 86; F. Muell. Fragm. ix. 36.

W. Australia. King George's Sound, R. Brown, A. Cunningham and others, and in many stations thence to Vasse and Swan Rivers, Drummond, Preiss, n. 1807, Oldfield and others.

4. ***M. sphærocephala*, Benth.**—Stems in large tufts 3 to 5 ft. high, slender but rigid, usually compressed or 3-angled under the inflorescence. Leaves at the base of the stem long, rigid, flat or concave, rarely above 1 line broad, but dilated at the base into open brown sheaths fringed with long woolly hairs. Flower-head very compound and dense, globular, about $\frac{1}{2}$ in. diameter. Involucral bracts very broadly ovate or orbicular, as long as or rather longer than the spikelets; one outer one tapering to an obtuse point usually very short but sometimes longer and leaflike, all the others very broad and obtuse, and several similar bracts prominent within the head. Spikelets very numerous, somewhat compressed, 2 to 3 lines long. Flowers 2 close together, the outer one male the upper hermaphrodite. Glumes obscurely distichous, 4 or 5 outer ones very broad and obtuse gradually shorter, flowering glumes nearly twice as long, broad and completely enveloping each other, the outer one rigid, the inner more membranous. Hypogynous bristles 3, short and slender. Stamens 3. Style-branches 3. Nut obovoid, seated on a raised torus or thick stipes, crowned by the narrow pubescent base of the style (perhaps at length deciduous).—*Chætospora sphærocephala*, R. Br. Prod. 233; Bæckel. in Linnaea, xxxviii. 296; F. Muell. Fragm. ix. 33; *Gymnoschænus sphærocephalus*, Hook. f. Fl. Tasm. ii. 83, t. 142; *Xyris lævis*, Nees in Sieb. Pl. Nov. Holl. n. 204; *Gymnoschænus adustus*, Nees in Ann. Nat. Hist. ser. 1. vi. 47.

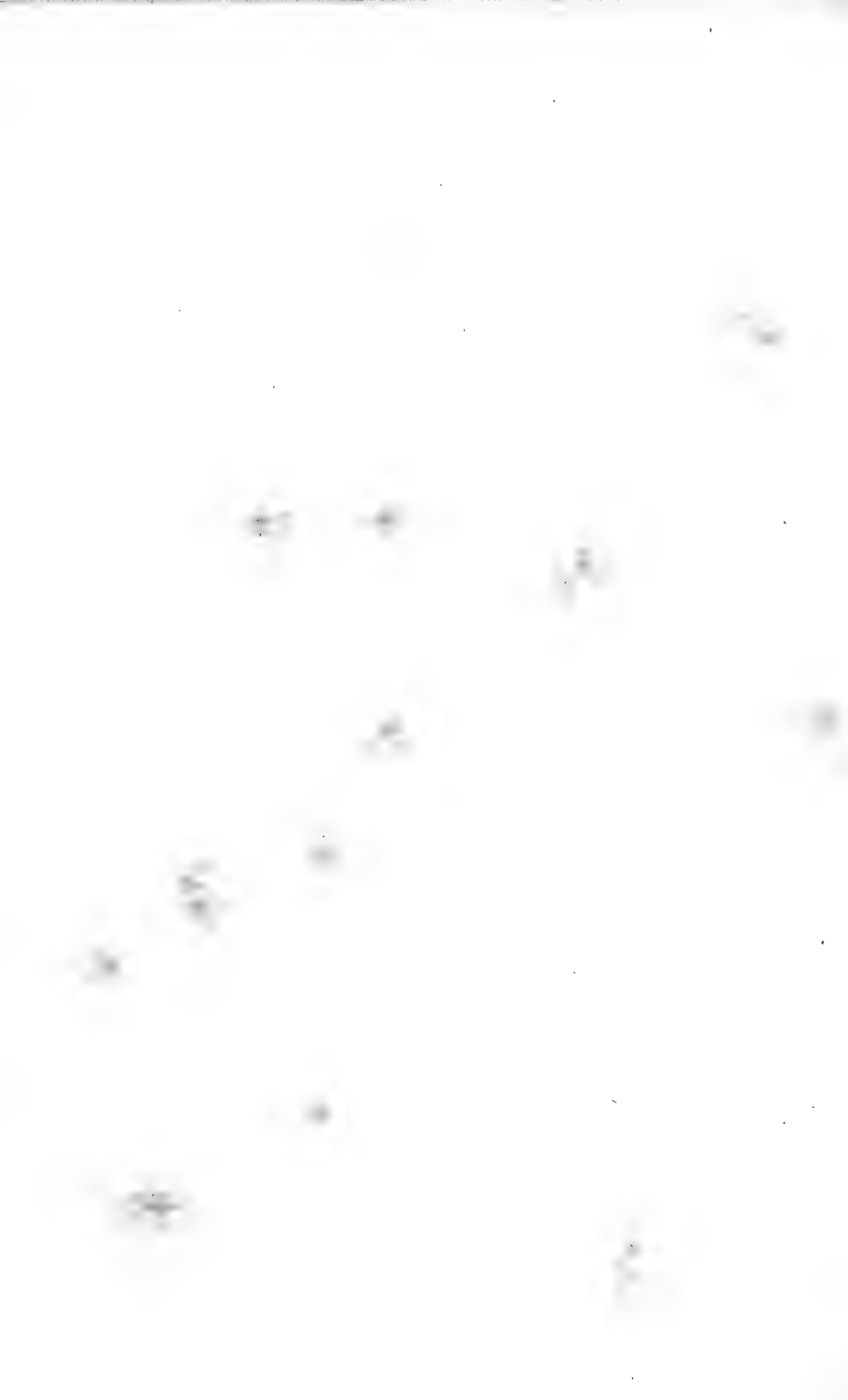
N. S. Wales. Port Jackson, R. Brown and others; northward to New England, C. Stuart, Leichhardt; southward to Twofold Bay, F. Mueller.

Victoria. Bunip Creek, Gipps' Land, Wilson's Promontory, Mount Imlay, F. Mueller; Mount William Creek, Sullivan.

Tasmania. Abundant in marshes in many parts of the island, Gunn and others.

5. ***M. anceps*, Benth.**—Very closely allied to *M. sphærocephala*. Stems more slender than in that species though rigid, 1 to 2 ft. high or perhaps sometimes more, often compressed under the inflorescence. Leaves as long as or longer than the stem, crowded at its base, nearly 1 line broad, obtuse, rigid, dilated at the base into long brown open sheaths fringed with long slender hairs. Flower-head globular, rather smaller than in *M. sphærocephala*, the involucral bracts ovate, 2 or more of them produced into linear points or laminae sometimes very short but often 1 or even 2 in. long, the inner bracts small. Spikelets very similar to those of *M. sphærocephala*, with 2 or 3 short outer empty glumes, and 2 flowering ones much longer and completely enveloping each other. Flowers 2, apparently similar to those of *M. sphæro-*





cephala, but too young for accurate description in our specimens.—*Chaetospora anceps*. R. Br. Prod. 233; *Chaetospora elongata*, Nees in Pl. Preiss. ii. 275; *Schænus elongatus*, F. Muell. Fragm. ix. 30.

W. Australia. King George's Sound and neighbouring districts, R. Brown, *Drummond*, n. 267, *Preiss*, n. 1560, F. Mueller and others. A more perfect series of specimens may prove this to be a variety only of *M. sphærocephala*.

21. CARPHA, R. Br. partly.

Spikelets in a loose terminal cluster or corymb, or in a species not Australian, in a long panicle, with 1 flower. Glumes several, distichous, membranous, pale brown, the outer empty ones gradually shorter. Hypogynous bristles 6, long, plumose, spreading and papus-like under the fruit. Stamens 3. Style branches 3. Nut oblong, 3-angled, tapering into the hardened persistent base of the style.—Perennials, leafy at the base only.

Besides the Australian species, which is also in New Zealand, there is one nearly allied to it in Antarctic and Chilian South America, and a third with a different habit but a congener in essential characters in New Caledonia. Brown included five Australian species in the genus, but with doubts as to some of them. Of these three in which the glumes are not distichous now form the genus *Cyathochaeta*, and the fourth in habit as well as in the bristles and other characters appears to be better placed in *Mesomelæna*.

1. **C. alpina**, R. Br. Prod. 230.—Stems under 6 in. high in high alpine situations, attaining 1 ft. when luxuriant. Leaves at the base only and much shorter, rather rigid, obtuse, flat or concave, $\frac{1}{2}$ to $1\frac{1}{4}$ lines broad, with broad membranous open sheathing bases. Corymb terminal, sometimes dense almost forming a head, sometimes the partial clusters loose and shortly pedunculate. Involucral bracts usually 2, leaflike and longer than the inflorescence, the inner ones smaller narrow and more glumelike. Spikelets flat, lanceolate, pale-coloured, varying from 4 lines in the smaller specimens to 6 or 7 lines long in luxuriant ones. Glumes usually 4, distichous, acute, very thinly membranous or almost hyaline but rather rigid and chaff-like, the outer ones much shorter, and above the flower a small narrow empty glume. Hypogynous bristles nearly as long as the glume, plumose the whole length with long hairs, persistent and spreading or recurved under the fallen nut. Nut nearly 2 lines long, terminating in a rigid point formed by the base of the style, which shows no sign of falling off in any of the specimens seen.—Kunth, Enum. ii. 322; Bœckel. in Linnæa, xxxviii. 269; Hook. f. Fl. Tasm. ii. 84; Hook. Ic. Pl. t. 1216; *Rhynchospora alpina*, Spreng. Syst. i. 195; *Carpha nivicola*, F. Muell. in Trans. Phil. Soc. Vict. i. 111, and in Hook. Kew Journ. viii. 335; *Chaetospora alpina*, F. Muell. Fragm. ix. 39.

Victoria. Hardinger Range and Mount Wellington, F. Mueller.

Tasmania. Table Mountain (Mount Wellington) R. Brown; not uncommon on the mountains at an elevation of 4000 to 6000 ft., J. D. Hooker.

Also in New Zealand.

22. TRICOSTULARIA, Nees.

(Discopodium, Steud.)

Spikelets in a spikelike or loose or much-branched panicle, with 1 to 3 flowers, the upper one fertile, the lower sterile or male or deficient, the rhachis very short and straight. Glumes scarcely distichous, membranous, pale brown, 2 to 4 outer empty ones, and a small narrow empty one immediately above the upper flower. Hypogynous bristles 6 or fewer, short slender and usually unequal. Stamens 3. Style slender, deciduous; stigmatic branches 3, filiform. Nut obovoid, often contracted at the base but not distinctly stipitate.—Perennials. Leaves radical, often reduced to sheathing scales rarely 1 or 2 distant on the stem. Spikelets rather small, sessile or pedunculate, solitary or clustered in the axils of sheathing bracts of which the lower ones have sometimes leaflike laminae, or variously paniculate.

Besides the Australian species which are endemic, there is one in Ceylon and another in Borneo. The nut is nearly that of *Schœnus*, but the flowers when more than one are close together without the more or less flexuose rhachis characteristic of *Schœnus*, and it is the terminal not the lower one which is specially fertile.

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| Panicle very loose, narrow, leafy. Leaves linear or subulate, chiefly radical. Spikelets 2 to 2½ lines, with 2 rarely 3 flowers | 1. <i>T. paludosa</i> . |
| Spike of 2 or 3 2-flowered spikelets. Leaves shortly subulate or reduced to sheathing scales | 2. <i>T. pauciflora</i> . |
| Panicle short and spikelike. Spikelets 2-flowered. No leaves besides the sheathing scales at the base of the stem. | |
| Spikelets ovoid-oblong, scarcely 2 lines. Outer bracts 2 to 4 lines long | 3. <i>T. compressa</i> . |
| Spikelets narrow, fully 2 lines. Outer bracts erect, 6 to 9 lines long | 4. <i>T. Neesii</i> . |
| Panicle compound, rather dense, spreading. Spikelets numerous, clustered, 1-flowered, 1½ to 2 lines long. Leaves radical, linear | 5. <i>T. fimbristylloides</i> . |

1. ***T. paludosa*, Benth.**—Stems slender, rather weak, 6 in. to 1½ ft. high. Leaves at the base of the stem much shorter, narrow-linear or almost subulate, and 1 or 2 on the stem passing into the floral bracts. Panicle long narrow and very loose, the spikelets not numerous, all pedicellate, the peduncle or branches 2 or 3 together in the axils of leafy bracts, the lower bracts distant with long linear-subulate laminae, the upper ones small. Spikelets 2 to 2½ lines long, usually erect, lanceolate, more or less flattened, pale brown. Flowers usually 2, rarely 3, the upper one or rarely 2 fertile, the rhachis not elongated nor flexuose between them. Glumes distichous, acute or the outer one short and aristate, about 4 outer ones empty and a small empty glume close to the upper flower. Hypogynous bristles 6, shorter than the nut, shortly serrulate-ciliate. Stamens 3. Style slender, deciduous. Nut ovoid, finely 3-ribbed, smooth or minutely granular.—*Chaetospora paludosa*, R. Rr. Prod. 233; F. Muell. Fragm. ix. 35.

Queensland. Moreton Bay, F. Mueller.

N. S. Wales. Port Jackson, R. Brown, F. Mueller, Gulliver.



2. **T. pauciflora**, *Benth.*—Stems filiform, 6 in. to 1 ft. high. Leaves 1 or 2 at the base of the stem much shorter and subulate or all reduced to sheathing scales with short subulate points, and sometimes a similar sheathing scale on the stem higher up. Spike terminal, reduced to 2 or 3 spikelets, each in the axil of a narrow membranous bract, the lowest with a short subulate point and sometimes rather distant. Spikelets ovoid, brown, about 2 lines long, with 2 flowers, the lowest barren. Glumes broad, acutely acuminate, 2 outer ones empty, the lowest rather shorter. Hypogynous bristles 6, very short, sometimes slightly dilated at the base, but neither thickened nor enlarged under the fruit. Nut ovoid, obtuse, prominently 3-ribbed to the top and sometimes slightly pubescent. — *Lepidosperma pauciflorum*, F. Muell. *Fragm.* ix. 23.

Victoria. Near Mount Abrupt, F. Mueller; near Mount William, Sullivan. The specimens were inadvertently referred by Hooker, *Fl. Tasm.* ii. 93, to *Lepidosperma filiforme*, the hypogynous setæ are precisely those of *Tricostularia compressa*, and do not enlarge into scales as in *Lepidosperma*, and the style and nut are entirely those of *Tricostularia*.

3. **T. compressa**, *Nees in Pl. Preiss.* ii. 83.—Stems from a slightly bulbous base, slender but rigid, terete or more or less compressed, 6 in. to 1½ ft. high, leafless except a close sheath at the base oblique at the orifice and tapering into a short erect point. Spike terminal, almost simple, pale brown, rarely above ½ in. long. Involucral bracts very shortly sheathing, narrow-lanceolate, several-nerved, acutely acuminate, 2 to 4 lines long, the lowest often not longer than the next. Spikelets solitary in the upper bracts, 2 or 3 together in the lowest, ovoid-oblong, pale brown, about 2 lines long. Glumes obscurely distichous, 3 or 4 outer empty ones broad, membranous, obtuse or scarcely acute, the lower ones rather shorter, the flowering glumes rather longer and an empty acute one close above the upper flower, the two flowers close together, the lower one sterile or male. Hypogynous bristles exceedingly short. Nut obovoid, the 3 ribs scarcely conspicuous, slightly tuberculate, on a thick torus but scarcely stipulate.—*Chætospora spicata*, Boeckl. in *Linnæa*, xxxviii. 297; F. Muell. *Fragm.* ix. 37.

W. Australia. Drummond, n. 328 (348 in herb. Hook.); Konkoberup Hills, *Preiss.* n. 1800; Stirling Range, F. Mueller.

4. **T. Neesii**, *Lehm. Pl. Preiss.* ii. 83.—Stems slender, 1 to 1½ ft. high, leafless except a rather long close sheath at the base oblique at the orifice and tapering into an erect point of 1 to 3 lines. Spike terminal, almost simple, sometimes oblong and under ½ in. long, sometimes elongated to 1 or even 2 in. Involucral bracts erect, acute, striate, the lowest ½ to ¾ in. long, the next shorter. Spikelets solitary or few together in the bracts, sessile or shortly pedicellate, brown, narrow, 2 lines long or rather more. Glumes thinly membranous, about 3 outer ones empty, scarcely shorter but with a more rigid keel produced into a short point, the inner and flowering ones broader obtuse and quite membranous. Flowers close together, both hermaphrodite,

but the lower one sterile. Hypogynous bristles very short. Nut obovoid, with 3 ribs very prominent on the top and sometimes slightly pubescent, contracted at the base, but not distinctly stipitate.—*Chaetospora Neesii*, Boeckel. in Linnæa, xxxviii. 297; F. Muell. Fragm. ix. 37.

W. Australia. *Drummond*, n. 329, 356, 394, *Preiss*, n. 1728; Swan River, *Miss Lukin*; Blackwood River, *Oldfield*, *Mrs. Hard*.

Var. *elatior*. Stems stouter, 2 ft. high or more. Spike $1\frac{1}{2}$ to 2 in. long. Outer glume-like bracts striate, $\frac{1}{2}$ in. long.—*Drummond*, n. 322.

Discopodium Drummondii, Steud. Syn. Glum. ii. 150, includes this and the preceding species.

5. **T. fimbristyloides**, *Benth.*—Stems from a thick rhizome 1 to 2 ft. high, striate or angular. Leaves at the base only, shorter than the stem, 1 to $1\frac{1}{2}$ lines broad, dilated at the base into a short open sheath bordered by a scarious membrane. Panicle compound, rather dense, 2 to 4 in. long, the branches clustered in the axils of leafy bracts with short brown sheaths and linear laminae, the lowest sometimes as long as the inflorescence, the others much shorter, the secondary ones more glumelike. Spikelets in clusters of 2 to 6, narrow, brown, $1\frac{1}{2}$ to 2 lines long, 1-flowered, the rhachis not elongated. Glumes membranous, acute, obscurely distichous, 2 outer empty ones, the lowest shorter and more acuminate, and close above the flower a narrow empty glume. Hypogynous bristles 6 or fewer, very fine, all very short or 1 or 2 as long as the nut. Stamens 3. Style slender, deciduous; branches 3. Nut ovoid, smooth, neither angled nor ribbed.—*Chaetospora fimbristyloides*, F. Muell. Fragm. ix. 34.

N. Australia. Near Providence Hill, *F. Mueller*; Port Essington, *Armstrong*. This species is very nearly allied to the *Cladium undulatum*, Thw. Enum. Pl. Zeyl. 353 (*Lepidosperma zeylanicum*, Boeckel. in Linnæa, xxxviii. 332) from Ceylon, and to an unpublished Borneo species. These three might almost rank as a distinct genus. The inflorescence and nut bring them near *Cladium*, in which genus however there are never any traces of hypogynous bristles. The general inflorescence is also that of some species of *Rhynchospora* and *Scleria*, rather than of *Fimbristylis*. The hypogynous bristles are usually minute but rigid, they do not however grow into thick scales as in *Lepidosperma*.

23. LEPIDOSPERMA, Labill.

Spikelets paniculate, sessile, scarcely flattened, with 2 or more flowers, the uppermost alone fertile, or rarely only 1 flower, the rhachis very short. Glumes almost distichous, several or only 1 or 2 outer empty ones gradually shorter, and a narrow empty one close above the flower enclosed in the flowering glume. Hypogynous scales or bristles 6 or fewer by abortion, usually seta-like or very thin and hyaline or minute at the time of flowering, enlarged under the fruit, thickened white and almost spongy, acuminate or setiferous, closely appressed in two rows to the base of the fruit and sometimes slightly cohering to each other at the base. Stamens 3, or very rarely in abnormal flowers 4 or 5. Style slender and deciduous, with 3 or very rarely 4 filiform stigmatic branches. Ovary crowned by a thick hemispherical or





cushion-like hardened apex (or base of the style?). Nut ovoid or oblong, obtusely 3-angled except the continuous obtuse apex.—Rhizome perennial. Stems flat, angular or terete. Leaves few at the base of the stem, equitant and vertically flattened or angular or terete like the stem, usually of the same breadth, and only to be distinguished from it by their sheathing base and their tapering to a fine point. Spikelets usually numerous, clustered or singly sessile along the branches of a terminal panicle, which is either large and diffuse or long and erect, or short and dense or spikelike. Outer bract subtending the panicle usually with an erect point or lamina, which varies very much in length in the same species but rarely exceeds the inflorescence, the bracts under the primary branches with short points to the sheathing base, the inner ones more or less glumelike.

Besides the Australian species, which are perhaps all endemic, there are two in New Zealand of which one however may be identical with an Australian one, and one in South China, closely resembling one of the South-western Australian ones.

The genus is one of the most natural among Cyperaceæ, although when in flower it is chiefly distinguished by the foliage and inflorescence; the principal technical characters, the peculiar hypogynous scales, can often be ascertained only under the ripe or far advanced nut. At the time of flowering the bristles are often those of *Schoenus* or of *Tricostularia*; as the ovary grows the peculiar apex is constant, so also are the full grown scales. In all these respects as well as in the position of the leaves, the inflorescence, the position of the flowers, the terminal one hermaphrodite and fertile, the others when present male or barren, the structure of the flowers and of the fruit there is no variation in the genus, and the species can only be distinguished by vague characters derived from the shape of the stem and leaves, the degree of development of the inflorescence, the number and shape of glumes, etc. The limits of the species are therefore often very vague, and several of those here admitted may on the comparison of living specimens prove untenable.

SERIES I. Floribundæ.—*Stems usually broad, but thick in the middle with acute margins, or acutely 4-angled. Panicle large, very compound, pyramidal or loose.*

Stems usually 3 to 6 lines broad, with broad acute edges and a raised centre.

Panicle dense, the partial spikes clustered and sessile.

Spikelets 3 lines long. Glumes mostly obtuse . . . 1. *L. gladiatum*.

Panicle loose, usually secund, the partial spikes at least in the lower clusters pedunculate. Spikelets 3 lines. Glumes acute or mucronate . . . 2. *L. effusum*.

Panicle broad, with slender spreading branches. Spikelets 2 lines long . . . 3. *L. rupestre*.

Stems 2 to 3 lines broad, with narrow acute edges and convex sides. Panicle loose, usually secund. Spikelets and nuts small . . . 4. *L. elatius*.

Stems flat but thick, very acutely 4-angled. Panicle large and erect . . . 5. *L. tetraquetrum*.

SERIES II. Longitudinales.—*Stems flattened but very convex on both sides. Panicle narrow and dense, spikelike or with erect spikelike branches.*

Spikelets small, slightly spreading. Glumes acuminate, with recurved points . . . 6. *L. Oldfieldii*.

Spikelets very erect, with erect glumes.

Stems usually above 3 lines broad. Panicle 6 in. long or more . . . 7. *L. exaltatum*.

Stems usually under 3 lines broad. Panicle under 6 in. long, often spikelike and very dense . . . 8. *L. longitudinale*.

SERIES III. *Densifloræ*.—Stems flat or very slightly convex on one or both sides with acute edges, 1, 2 or rarely 3 lines broad. Panicle compound, short and dense, broad pyramidal ovate or rarely oblong, the branches or partial spikes sessile or nearly so in the clusters.

- Glumes acutely acuminate. Eastern species 9. *L. concavum*.
Outer glumes obtuse or scarcely mucronate. Western species 10. *L. angustatum*.

(The inflorescence of *L. concavum* sometimes approaches that of the *Floribundæ*, and that of *L. rupestre*, nearly that of *L. angustatum*, but the stems very different.)

SERIES IV. *Stenostachyæ*.—Stems either broad and very flat and thin, or when very narrow slightly convex on one or both sides or angular. Panicle narrow, loose or elongated.

Stems bordered on the edges by a fine brown line often resinous or with resinous exudations. Leaf-sheaths often resinous.

Spikelets with 1 barren flower. Glumes acute or acuminate.

Stems 3 to 6 lines broad, very flat, the margins continuous 11. *L. Drummondii*.

Stems 1 to $1\frac{1}{2}$ lines broad, the sides often slightly convex, the margins continuous 12. *L. Brunonianum*.

Stems $1\frac{1}{2}$ to 3 lines broad, flat, the margins resinous-tuberculate 13. *L. tuberculatum*.

Spikelets with 1 barren flower. Outer glumes obtuse 14. *L. resinosum*.

Spikelets with 2 or 3 barren flowers. Glumes rather acute 15. *L. viscidum*.

Stems not resinous, 1 to 2 or rarely $2\frac{1}{2}$ lines broad.

Stems about 1 line broad, convex on both sides but with acute edges. Western species 16. *L. costale*.

Stems very flat $1\frac{1}{2}$ to $2\frac{1}{2}$ lines broad with very acute edges. Eastern species 17. *L. laterale*.

Stems flat but rather thick, 1 to 2 lines broad, the edge scarcely acute. Eastern species.

Panicle spike-like or interrupted. Inner bracts aristate. Glumes acutely acuminate 18. *L. congestum*.

Panicle spike-like, interrupted. Spikelets in small distinct clusters. Glumes acuminate 19. *L. globosum*.

Panicle slender. Spikelets few.

Leaves the breadth of the stem, equitant 20. *L. lineare*.

Leaves none, replaced by sheathing scales 21. *L. aphyllum*.

Stems $\frac{1}{2}$ to $\frac{3}{4}$ lines broad, flat or angular.

Panicle branched, narrow but rather dense, 1 to $1\frac{1}{2}$ in. long. Western species 22. *L. gracile*.

Panicle almost reduced to a simple spike with distant spikelets. Eastern species 23. *L. semiteres*.

SERIES V. *Tereticaules*.—Stems slender, terete or angular-striate or slightly and irregularly compressed.

Panicle very dense, ovoid, under 1 in. long 24. *L. pubisquamum*.

Panicle rather dense, compound, 1 to $2\frac{1}{2}$ in. long, with erect or spreading branches.

Spikelets 3 lines long or rather more. Stems smooth.

Eastern species 25. *L. canescens*.

Spikelets about 2 lines long. Western species.

Stems strongly striate and usually scabrous 26. *L. scabrum*.

Stems smooth, scarcely striate 27. *L. tenue*.

- Panicle with few rather slender branches, erect or slightly spreading, the common rhachis straight 28. *L. leptostachyum*.
 Panicle slightly branched, with few spikelets, the common rhachis very much curved and reflexed.
 Leaves filiform, longer than the stem. Western species 29. *L. leptophyllum*.
 Leaves shorter than the stem. Eastern species 30. *L. tortuosum*.
 Panicle or spike simple or slightly branched, the spikelets narrow and distant, the rhachis filiform.
 Spike branched, rhachis flexuose 31. *L. flexuosum*.
 Spike simple; rhachis straight or nearly so 32. *L. filiforme*.
 Panicle spikelike interrupted, the spikelets in dense clusters or partial spikes sessile along the simple rhachis.
 Spikelets about 3 lines long, numerous. Barren flowers 2 or 3. Western species 33. *L. striatum*.
 Spikelets about 3 lines long, numerous. Barren flower 1. Eastern species 34. *L. Neesii*.
 Spikelets few in the clusters, very narrow, 4 to 5 lines long. Eastern species 35. *L. carphoides*.

SERIES I. FLORIBUNDÆ.—Stems usually broad but thick in the middle with acute margins or acutely 4-angled. Panicle large, very compound, pyramidal or loose.

1. ***L. gladiatum***, *Labill. Pl. Nov. Holl.* i. 15, *t.* 12.—Stems rigid, attaining several feet, much flattened, but convex on both sides along the centre, usually nearly $\frac{1}{2}$ in. broad, but varying from 3 to 7 lines, the acute very flat edges smooth or minutely scabrous. Leaves equitant, as broad as or broader than the stem and often as long. Panicle dense and compound, 3 to 6 in. long, the branches or secondary spikes densely clustered and all sessile, or rarely the panicle longer with the lowest cluster of spikes distant. Involucral bracts with short broad flat sheaths, the lowest with a rigid erect lanceolate or linear lamina rarely above 1 in. long, the upper with shorter points, the inner bracts embracing the branches and spikelets glumelike. Spikelets sessile crowded or clustered along the branches, about 3 lines long, with usually 1 barren flower below the perfect one. Glumes broad, obtuse or scarcely mucronate, 4 or 5 outer empty ones gradually shorter. Hypogynous scales very small hyaline and fringed at the time of flowering, thickened and acuminate but not setiferous under the fruit.—*R. Br. Prod.* 234; *Kunth, Enum.* ii. 316, *Bœckel. in Linnæa*, xxxviii. 315; *Nees in Pl. Preiss.* ii. 89; *Hook. f. Fl. Tasm.* ii. 90; *F. Muell. Fragm.* ix. 24; *L. ensatum*, *Nees in Ann. Nat. Hist. ser.* 1, vi. 47.

Victoria. Maritime sands, Portland, *Robertson, C. Stuart* and others.

Tasmania. Common on sand hills near the north coast, *Gunn*; King's Island, *Gowan* and others.

S. Australia. Memory Cove, *R. Brown*; Port Lincoln, *S. F. Browne*; Holdfast Bay, *F. Mueller*.

W. Australia. King George's Sound, *R. Brown*, *Oldfield*, also *Drummond, n.* 274; Swan River, *Preiss, n.* 1771.

2. ***L. effusum***, *Benth.*—Stems many feet high, 3 to 6 lines broad, with broad acute flat margins and a raised centre as in *L. gladiatum* and

leaves the same. Panicle larger and looser, very compound, 6 in. to above 1 ft. long, the branches or partial panicles clustered in the sheathing bracts, but more or less pedunculate and the glumes much more mucronate or acute.

W. Australia. *Drummond*, n. 273, 275; King George's Sound and adjoining coast, *Muir* and others; Blackwood River, *Oldfield* and others. Possibly a variety of *L. gladiatum* but the differences constant in all the specimens from the various collectors.

3. ***L. rupestre*, Benth.**—Stems 2 or 3 ft. high, 3 to 5 lines broad, with broad acute flat margins and a raised centre as in *L. gladiatum* and leaves the same. Panicle broad, very compound, 3 to 4 in. long and often as broad, the spreading or recurved branches much more slender than in *L. gladiatum*. Spikelets about 2 lines long, narrow, incurved, with 1 barren flower besides the perfect one. Glumes all obtuse or the innermost scarcely acute, 5 or 6 outer empty ones gradually shorter. Bristles or scales minute or scarcely conspicuous at the time of flowering, normal under the fruit. Nut not seen.

W. Australia. Rocks, Murchison River, the stems very sweet-scented, *Oldfield*.

4. ***L. elatius*, Labill. Pl. Nov. Holl. i. 15, t. 11.**—Stems 3 to 8 ft. high, 2 to 5 lines broad, much flattened, but both sides convex, the edges very acute and slightly scabrous. Leaves equitant, as broad and nearly as long as the stem. Panicle 8 in. to 1 ft. long, loose and secund or nodding, the branches long and compound, clustered in the sheathing bracts. Lower bracts distant with rather long sheaths and the lowest with a lamina of 1 to 2 in., the upper bracts gradually smaller. Spikelets numerous, sessile along the branches, loose or rather crowded but not clustered, about 2 lines long. Barren flowers 1 to 6 besides the perfect one. Glumes acute or shortly mucronate, 1 to 4 outer empty ones shorter and sometimes an empty one above the barren flowers next to the fertile-flowering glume. Scales thin and hyaline at the time of flowering, thickened, acuminate but not setiferous under the nut, which is rather small.—R. Br. Prod. 234; Kunth, Enum. ii. 316; Bœckel. in Linnæa, xxxviii. 316; Hook. f. Fl. Tasm. ii. 90; F. Muell. Fragm. ix. 25; *Chaetospora concava*, Nees in Ann. Nat. Hist. ser. 1, vi. 47.

Victoria. On the Yarra, *Sullivan*; Dandenong and Disappointment Mountains, *F. Mueller*; Mount Macedon, *Walter*.

Tasmania. Derwent River, *E. Brown*; common in forests and in damp soil throughout the island, *J. D. Hooker*.

5. ***L. tetraquetrum*, Nees in Pl. Preiss. ii. 90.**—Stems stout, from 3 or 4 ft. to twice that height, flat but thick, with 4 acute angles. Leaves similarly thick and 4 angled, dilated at the base into a broad sheath. Panicle loose and very compound, pyramidal, 6 in. to 1 ft.

long, the branches erect or flexuose. Outer sheathing bracts without any or only very short laminae. Spikelets sessile along the branches, sometimes slightly clustered, about 3 lines long, with 1 or 2 or rarely more barren flowers besides the perfect one. Glumes acute or obtuse and shortly mucronate, 3 or 4 outer empty ones gradually shorter. Scales under the nut short and acute, 1 or 2 sometimes setiferous.—F. Muell. *Fragm.* ix. 24.

W. Australia. *Drummond*, n. 346; Darling Range, *Preiss*, n. 1762; King George's Sound, *F. Mueller*; Karri Dale, *Walcot*; Blackwood and Canning Rivers, *Oldfield*.

SERIES 2. LONGITUDINALES.—Stems flattened but very convex on both sides and sometimes hollow. Panicle narrow and dense, spike-like or with erect spikelike branches.

6. *L. Oldfieldii*, Hook. f. *Fl. Tasm.* ii. 91, t. 146, A.—Stems 4 to 6 ft. high, 2 to 3 lines broad, flattened but with very convex sides, the acute edges very narrow. Leaves the same breadth. Panicle long and narrow but interrupted, often exceeding 1 ft., the spikelets densely crowded on the short branches of the upper spikelike part of the panicle, the lower branches longer and more distant but erect. Lowest bract with a lamina sometimes 2 or 3 in. long, the upper ones very short. Spikelets of a rich brown, densely clustered, nearly 3 lines long, with 1 or 2 barren flowers besides the perfect one. Glumes acute or mucronate, the inner ones almost aristate with spreading points, 2 or 3 outer empty ones shorter. Scales under the nut narrow but thick, often tapering into a seta. Nut small as in *L. elatius*.

Tasmania. New Norfolk, *Oldfield*; Southport, *C. Stuart*.

7. *L. exaltatum*, R. Br. *Prod.* 234.—Very near *L. longitudinale* in which it is included by F. Mueller, and perhaps correctly so. Stems several feet high, 3 to 4 lines broad, flattened but convex on both sides and often hollow, the edges prominent, acute, slightly scabrous. Leaves the same breadth. Panicle 6 in. to 1 ft. long, erect, compound, the branches and spikelets numerous and erect. Lowest bract with a lamina rarely exceeding 1 in. Spikelets crowded, $2\frac{1}{2}$ to 3 lines long, with 1 rarely 2 barren flowers besides the perfect one. Glumes acute or acuminate, 2 or 3 outer empty ones rather shorter. Scales very small when in flower, thickened but not so much enlarged under the fruit as in most species and narrow, not setiferous.—Nees in *Pl. Preiss.* ii. 90.

Queensland. Brisbane River, *Bailey*; Pine River, *Eades*.

N. S. Wales. Port Jackson, *R. Brown*; Blue Mountains, *Woolfs*; New England, *C. Stuart*, also in *Leichhardt's* collection.

Victoria. Glenelg River, *Robertson*.

W. Australia, *Drummond*; Swan River, *Preiss*, n. 1758, 1764.

8. *L. longitudinale*, Labill. *Pl. Nov. Holl.* i. 16, t. 13.—Stems 3

to 5 ft. high, 2 or rarely 3 lines broad, compressed but both sides convex and often hollow and the edges though acute scarcely prominent. Leaves equitant, rather flatter and broader and shorter than the stem. Panicle erect, compound but narrow, 3 to 6 in. long, with dense erect spikelike branches, the lower branches distant and pedunculate. Spikelets crowded or clustered, erect, 2 to 3 lines long, with 1 or 2 barren flowers besides the perfect one. Glumes obtuse, shortly mucronate or the inner ones almost acute, 3 or 4 outer ones empty and gradually shorter. Scales under the nut narrow, acuminate.—Hook. f. Fl. Tasm. ii. 91.

Victoria. Wilson's Promontory and Prince Albert River, Gipps' Land, *F. Mueller*; French Island, *Beveridge*; Queen's Cliff, *Green*; Portland, *F. Mueller*.

Tasmania. Common in sandy and wet places near the sea, *J. D. Hooker* and others.

W. Australia. Gordon, Tone, South Hutt, and Tweed Rivers, *Oldfield*; Busselton, *Pries*.

SERIES III. DENSIFLORÆ.—Stems flat or very slightly convex on one or both sides, with acute edges, 1, 2 or rarely 3 lines broad. Panicle compound, short and dense, broadly pyramidal, ovate or rarely oblong, the branches or partial spikes sessile or nearly so in the clusters.

9. *L. concavum*, R. Br. Prod. 234.—Stems 1 to 2 ft. high, quite flat or very slightly convex on one side, $1\frac{1}{2}$ to $2\frac{1}{2}$ lines broad, the edges very acute, slightly scabrous. Leaves equitant, shorter than the stem and about as broad. Panicle in the typical form erect, compound, dense, oblong or thyrsoïd $1\frac{1}{2}$ to 3 in. long. Outer involucral bract longer or shorter than the panicle. Spikelets densely crowded and clustered, about 3 lines long, with 1 or 2 barren flowers besides the perfect one. Glumes acute, the inner ones acutely acuminate, the outer with shorter points, about 4 outer empty ones gradually shorter. Scales or bristles at the time of flowering scarcely dilated at the base, normally thickened under the nut into lanceolate scales with a setalike point often wearing away.—*L. squamata*, R. Br. Prod. 235; *F. Muell. Fragm.* ix. 26, but not of Labill.; *L. Sieberi*, Kunth, Enum. ii. 320, Bœckel. in Linnæa, xxxviii. 318; *L. gladiatum*, Nees in Sieb. Agrostoth. n. 10, not of Labill.; *L. laterale*, Hook. f. Fl. Tasm. ii. 91, t. 147, A. not of R. Br.

Queensland. Rocks, Moreton Island, *F. Mueller*; Rockhampton, *Thozet* (with narrower stems).

N. S. Wales. Botany Bay, *Banks and Solander*; Port Jackson, *R. Brown* and others.

Victoria. Near Melbourne and Queenscliffe, *F. Mueller*; French Island, *Beveridge*; Gabo Island, *Maplestone*.

Tasmania. Derwent River, *R. Brown*; Circular Head and Georgetown, *Gunn*; Southport, *C. Stuart*.

S. Australia. Lake Victoria, *F. Mueller*.

Var. *pyramidatum*. Panicle looser, often above 6 in. long but very compound, the spikelets 3 lines long or more and the glumes acuminate as in the typical form.

—Moreton Bay, *F. Mueller*; Paramatta, *Woolfs*; Twofold Bay, *F. Mueller*; Yarra, *Sullivan*, Ballarat, *F. Mueller*; Swanport, *Story*; Onkaparinga, *F. Mueller*.

The Tasmanian rather smaller forms, have probably on account of the dense inflorescence been supposed by R. Brown as well as by *F. Mueller* to be the *L. squamatum* of Labillardière, whose specimens do not appear to have been seen by Brown or by any subsequent botanist, and the narrow leaves and obtuse glumes figured are quite at variance with our plant. They seem rather to represent the *L. angustatum*, which however is exclusively Western.

10. *L. angustatum*, R. Br. Prod. 235.—Stems 1 to 2 ft. high, 1 to $2\frac{1}{2}$ rarely 3 lines broad, very flat or at length convex on both sides, the edges acute and slightly scabrous or smooth. Leaves equitant, about the same breadth but usually shorter. Panicle very compact and compound, usually black, ovoid or pyramidal, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long and sometimes as broad, the branches as well as the spikelets erect or more or less spreading, more slender than in *L. concavum*. Spikelets 2 to 3 lines long or rarely rather more, narrow, with 1 barren flower besides the perfect one. Inner glumes acute or acuminate but the 2 to 4 outer empty ones gradually shorter and obtuse or very shortly mucronate. Bristles minute under the flower, scales under the nut lanceolate and acuminate with short or without any terminal setæ.—*L. squamatum*, Nees in Pl. Preiss. ii. 91, and perhaps of Labill. Pl. Nov. Holl. i. 17, t. 16; Boeckel. in Linnæa, xxxviii. 325.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *F. Mueller* and others, and thence to Swan River, *Preiss*, n. 1785, 1804, *Oldfield* and others, also *Drummond*, n. 41, 161, 276, 382, 880.

Var. *ustulatum*. Panicle small, ovoid, very dense, with rather larger pale-coloured spikelets.—*L. ustulatum*, Steud. Syn. Glum. ii. 157.—*Drummond*, n. 345.

Var. *curvispicula*. Spikelets mostly curved, very spreading as well as the branches of the panicle.—King George's Sound and neighbouring districts, *F. Mueller*, *Oldfield*, *Muir* and others; *Drummond*, n. 37, 38, 53, 277, 874, 884; Busselton, *Pries*.

The specimen I have seen of *L. fimbriatum*, Nees in Pl. Preiss. ii. 91, *Preiss*, n. 1793, in very young flower, appears to be this species, the description however refers rather to *L. viscidum*.

SERIES IV. STENOSTACHYÆ.—Stems either broad and very flat and thin, or when very narrow slightly convex on one or both sides or angular. Panicle narrow, loose or elongated.

11. *L. Drummondii*, Benth.—Stems 2 to 3 ft. high, 3 to 6 lines broad, very flat or very slightly convex on one side, prominently striate, the edges acute, bordered by a brown line entire or slightly resinous-scabrous. Leaves equitant and as broad, the sheaths usually resinous. Panicle narrow and loosely compound, 4 to 8 in. long, the branches slightly spreading and usually secund, the lower ones long and sometimes the lower clusters distant. Lowest bract with a leaf-like lamina short or long. Spikelets in little spikes or clusters, scarcely

2 lines long, with 1 barren flower besides the perfect one. Glumes acute or mucronate, 2 or rarely 3 outer ones empty. Scales under the nut lanceolate, acute, with short points.

W. Australia, *Drummond* n. 111; King George's Sound, *Maxwell*, *Oldfield*. This and the three following species are very closely allied to *L. viscidum*.

12. ***L. Brunonianum***, *Nees in Pl. Preiss.* ii. 92.—Stems $1\frac{1}{2}$ to 2 ft. high and 1 to $1\frac{1}{2}$ lines broad, quite flat or very slightly convex on one side, edged with a brown line usually resinous-scabrous or rarely quite smooth. Leaves equitant, of the breadth of the stem, the sheaths scarcely resinous. Panicle narrow and rather loose, 3 to 5 in. long, the branches and spikelets all erect. Lowest outer bract rarely above 1 in. long. Spikelets in little spikes or clusters along the branches, scarcely 2 lines long, with 1 barren flower besides the perfect one. Glumes acute or very shortly mucronate, 2 or rarely 3 outer ones shorter and empty. Scales minute at the time of flowering, lanceolate and acute with short points under the nut.—*Bœckel. in Linnæa*, xxxviii. 323.

W. Australia. Swan River, *Preiss*, n. 1768; King George's Sound, *Muir*, also *Drummond*, n. 42, 881, 882, 885.

13. ***L. tuberculatum***, *Nees in Pl. Preiss.* ii. 90.—Stems $1\frac{1}{2}$ to 2 ft. high or more, $1\frac{1}{2}$ to 3 lines broad, very flat or slightly convex on one side, bordered as well as the leaves by resinous tubercles like those of *L. viscidum* but more prominent, the leaf-sheaths not usually so resinous as in that species. Panicle narrow and dense or longer and looser, 2 to 6 in. long, the spikelets usually in small spikes rarely in short dense clusters on the spikelike partial panicles or branches, all erect, and the lower branches sometimes long. Lowest bract often leaflike and several inches long, the others usually much smaller. Spikelets 2 to $2\frac{1}{2}$ lines long, with 1 barren flower besides the perfect one. Glumes acute or shortly mucronate, rather broad, 2 or rarely 3 outer ones empty and shorter. Scales under the nut acuminate, with short fine points.—*F. Muell. Fragm.* ix. 26.

W. Australia. York district, *Preiss*, n. 1765; also *Drummond*, n. 34, 873 and 875; n. 879 with narrower stems and leaves and short panicles, and n. 116 with the spikelets densely clustered on the short branches of the panicle.

14. ***L. resinosum***, *F. Muell. Herb.*—Stems 2 ft. high or more, 2 to 3 lines broad, much flattened but both sides slightly convex, very finely striate, the acute edges bordered by a very fine brown line quite continuous and smooth. Leaves similar, the brown sheathing bases very resinous. Panicle loose, compound, erect or slightly curved, rather narrow, 6 in. long or more, the spikelets singly sessile along the rather slender branches, the lower primary branches long and distant. Outer bract with a lamina rarely exceeding 1 in. Spikelets narrow, often curved or spreading, $2\frac{1}{2}$ to 3 lines long, with 1 barren flower besides the perfect one. Glumes obtuse or mucronate, or the inner

ones almost acute, 2 or 3 outer ones empty and shorter. Scales minute or scarcely visible at the time of flowering, thickened, ovate, acuminate or shortly setiferous under the nut.—*Machærina resinosa*, Nees in Pl. Preiss. ii. 82; Bœckel. in Linnæa, xxxviii. 252; *Lepidosperma Sieberi*, Nees in Pl. Preiss. ii. 90, not of Kunth.

W. Australia. Swan River, *Drummond*, 1st coll. also n. 34, 110, 803 (or 863), 883; York district, *Preiss*, n. 1759, 1767; Beaufort River, *Oldfield*.

The original specimens described by Nees as a *Machærina* are in flower only, when the characteristic scales of *Lepidosperma* cannot be recognised. Drummond's n. 883 with half-grown nuts, and Oldfield's in fruit, have all the appearance of belonging to the same species and confirm the transference of the plant to *Lepidosperma*.

15. **L. viscidum**, *R. Br. Prod.* 234.—Stems 1 to 2 feet high, very flat or slightly convex on one side, usually about 2 lines broad as well as the leaves, the edges scabrous with minute brown asperities or resinous exudations, the leaf-sheaths more or less viscid. Panicle narrow, rather dense, 3 to 6 in. long, the spikelets in compound partial spikelike panicles, the lower ones sometimes long and distant but erect. Lowest outer bract sometimes long and leaf-like, or all short. Spikelets about 3 lines long, with 2 or 3 barren flowers besides the perfect one. Glumes rather acute or very shortly mucronate, 2 or 3 outer empty ones shorter and often an empty one immediately above the barren flowers. Scales scarcely conspicuous at the time of flowering, thickened under the nut and acute or acuminate but not setiferous.—Nees in Pl. Preiss. ii. 91; *L. Muelleri*, Bœckel. in Linnæa, xxxviii, 320.

N. S. Wales. Mudgee, *Taylor*.

S. Australia. Port Lincoln, *R. Brown*, *J. S. Browne*; Lofty and Barossa Ranges, *F. Mueller*.

W. Australia. Mount Clarence, King George's Sound, *Preiss*, n. 1766, apparently the same species but with a shorter and more dense panicle and the outer bract very long. Very near *L. resinorum*, and *L. tuberculatum*, but the glumes not so acute and the barren flowers more numerous in the spikelets examined, besides the difference in the margins of the stem and leaves.

16. **L. costale**, *Nees in Pl. Preiss.* ii. 92.—Stems 1 to 1½ ft. high, usually about 1 line broad, compressed but both sides convex, with narrow rather acute edges not resinous. Panicle narrow, rather loose, 2 to 4 in. long, the branches and spikelets all erect. Lowest outer bract rarely above 1 in. long. Spikelets in little spikes or clusters, scarcely 2 lines long, with 1 barren flower besides the perfect one. Glumes acute or very shortly mucronate, about 3 outer empty ones shorter. Scales under the nut not setiferous.—Bœckel. in Linnæa, xxxviii. 324.

W. Australia. *Drummond*, n. 43, 884; York district, *Preiss*, n. 1798, 1799; Mount Churchman, *F. Mueller*. The inflorescence is that of *L. Brunonianum*, but the stems are narrower and convex with the margins not all resinous.

17. **L. laterale**, *R. Br. Prod.* 234.—Stems often above 2 ft. high, 1½ to 3 lines broad, very flat or slightly convex on one side with very acute cutting edges. Leaves as broad and sometimes as long, but

mostly shorter. Panicle usually narrow and loose, 4 to 8 in. long, the branches not numerous, the lower ones elongated but erect, the spikelets sessile, distinct or scarcely clustered. Lowest outer bract sometimes with an erect leafy lamina of several inches but often under 1 in. the upper ones short. Spikelets about 2 lines long, with rarely more than 1 barren flower besides the perfect one. Glumes acute and sometimes produced into short points but not aristate, 3 or 4 outer empty ones gradually shorter. Hypogynous bristles or scales narrow at the time of flowering and hyaline; scales under the nut lanceolate, acuminate, tipped with seta-like point which however often wear away.—*L. lineare*, Nees in Sieb. *Agrostoth.* n. 9, Kunth, *Enum.* ii. 318, not of R. Br.; *L. concavum*, Hook. f. *Fl. Tasm.* ii. 91, t. 146, B, not of R. Br.

Queensland. Brisbane River, Moreton Bay, *Leichhardt*, *C. Stuart*, *Bailey* and others.

N. S. Wales. Port Jackson, *R. Brown*; Macleay River, *Beckler*; New England, *C. Stuart*.

Victoria. Murray River, Wilson's Promontory, *F. Mueller*; Little River, *Fullagar*.

Tasmania. Launceston, *Gunn*; South Port, *C. Stuart*; Swan Port, *Story*.

Var. majus. Stems broad and very flat. Panicle 6 in. to 1 ft. long. Spikelets rather longer and not so close. Stamens occasionally 4, style-branches frequently 4. *L. tetragynum*, R. Br. *Prod.* 234.—Port Jackson, *R. Brown*, *A. Cunningham* and others.

Var. angustum. Stems 1 to 1½ lines broad, often slightly convex along the middle at least on one side.—*L. longitudinale*, R. Br. *Prod.* 234, not of Labill.; *L. angustifolium*, Hook. f. *Fl. Tasm.* ii. 92, t. 147, B.—Sutton Forest, *Mrs. Calvert*; Arne River, *Beckler*; New England, *C. Stuart*; Macalister's River, *F. Mueller*; Adventure Bay, *Nelson* in herb. *R. Br.*; Launceston, *Gunn*.

18. ***L. congestum***, *R. Br. Prod.* 234.—Stems 4 to 10 in. high, flat or very slightly convex on one or both sides, 1 to 1½ lines broad, the edges not very acute. Leaves nearly as long and the same breadth, all rigid, smooth and shining. Panicle compact, narrow, 1 to 3 in. long, interrupted at the base, the spikelets in sessile clusters or in short dense compound spikes. Bracts rigid, acuminate, with subulate pungent erect points longer than the enclosed spikelets, the lowest outer bract sometimes as long as the inflorescence, the inner bracts all aristate. Spikelets about 2 lines long, with 1 barren flower besides the perfect one. Glumes acute. 4 or 5 outer empty ones gradually shorter with longer points. Hypogynous scales very minute or scarcely conspicuous at the time of flowering, but the flowers not fully developed in the specimens seen.

S. Australia. Memory Cove, *R. Brown*; Lake Hamilton, *Herb. F. Mueller*.

19. ***L. globosum***, *Labill. Pl. Nov. Holl.* i. 16, t. 14.—Stems 1 to 1½ ft. high, much flattened but usually convex on one or both sides, with obtuse edges. Leaves often nearly as long and the same breadth. Panicle narrow, 1 to 3 in. long, compact but interrupted, the spikelets in globular clusters or very short spikes, the lower ones distant.

Lowest outer bract sometimes erect rigid and 1 in. long, sometimes all short, not aristate. Spikelets about 2 lines long, with 1 barren flower besides the perfect one. Glumes acute, about 3 outer ones gradually shorter with longer points. Scales under the nut acuminate with fine points but scarcely setiferous.—*L. læve*, R. Br. Prod. 235.

Victoria. Port Phillip, *R. Brown*; Point Lonsdale and Queenscliff, *F. Mueller*; heath near Fitzroy River, *Robertson*.

Tasmania. Brown's River, *Oldfield*.

The species requires further examination from better specimens, most of ours have the inside of the spikelets destroyed by a black fungus. I have not seen Labillardière's. Brown's have the stems flatter than the others, all may prove to be varieties of *L. laterale* or of *L. lineare*.

20. ***L. lineare***, *R. Br. Prod.* 235.—Stems from under 6 in. to above 1 ft. high, about 1 line broad, compressed but both sides convex, the edges slightly prominent, acute, scabrous or nearly smooth. Leaves as long or sometimes longer and of the same breadth. Panicle narrow, from under 1 in. to $1\frac{1}{2}$ in. long, with few short branches, the lower ones often spreading, the spikelets not numerous though somewhat clustered. Lower outer bract leaflike, often exceeding the inflorescence, the upper ones short. Spikelets narrow, 2 to $2\frac{1}{2}$ lines long, with only 1 or sometimes no barren flower below the perfect one. Glumes acutely acuminate, about 3 outer empty ones gradually shorter. Hypogynous scales minute at the time of flowering, lanceolate and acuminate under the nut.—Hook. f. *Fl. Tasm.* ii. 92; *F. Muell. Fragm.* ix. 26; *L. Gunnii*, Bœckel. in *Linnæa*, xxxviii. 325.

N. S. Wales? Port Jackson, *C. Moore*; the specimens in bud only and rather doubtful.

Victoria. Wendu Vale, *Robertson*; Haidinger Range up to 5000 ft., *F. Mueller*.

Tasmania. Derwent River, *R. Brown*; near Launceston, *Gunn*; South Esk River, *C. Stuart*; Brown River, *Oldfield* (dwarf specimens scarcely 2 in. high).

Var. ? *depauperatum*. Stems and leaves more slender. Panicle reduced to 3, or 4 spikelets.—New England, *C. Stuart*.

Some specimens of *L. lineare* closely resemble the *Cladium schœnoides* in outward aspect, but, besides the generic character, they may be distinguished by the leaf-sheaths much less striate.

21. ***L. ? aphyllum***, *R. Br. Prod.* 235.—Stems above 1 ft. long and about $1\frac{1}{2}$ lines broad, very flat, without any leaves except some short sheathing scales at the base. Old inflorescence narrow, 1 to $1\frac{1}{2}$ in. long, almost simple, but the glumes, flowers, and nuts all fallen away from the specimen, leaving only the short rhachis of a few spikelets marked with the annular scars of the glumes, the genus therefore very uncertain.

W. Australia. Lucky Bay, *R. Brown*.

22. ***L. gracile***, *R. Br. Prod.* 235.—Stems slender, 1 to $1\frac{1}{2}$ ft. high, angular or flattened, with rather acute edges, under 1 line broad.

Leaves shorter and of the same breadth but flatter. Panicle narrow, 1 to $2\frac{1}{2}$ in. long, the branches short or the lower ones elongated, all erect. Spikelets crowded along the branches or rarely singly scattered, about 2 lines long, with 1 barren flower beside the perfect one. Glumes acute or the lower ones obtuse and mucronate, 3 or 4 outer ones empty and shorter. Scales under the nut acuminate but not setiferous.

W. Australia. King George's Sound, *R. Brown, Walcot*; also *Drummond*, n. 870, 873, 876.

L. lineare, var. *humile*, *Nees* in *Pl. Preiss.* ii. 90, *Preiss. n.* 1810 (*L. humile*, *Bœckel.* in *Linnaea*, xxxviii. 324), appears to me to be a short-stemmed form of *L. gracile*.

23. *L. semiteres*, *P. Muell.*; *Bœckel.* in *Linnaea*, xxxviii. 327.—Stems slender, 1 to $1\frac{1}{2}$ ft. high, sometimes terete but usually somewhat flattened, with obtuse edges, $\frac{1}{2}$ to $\frac{3}{4}$ line broad. Leaves shorter and flatter. Panicle spikelike, sometimes reduced to a simple spike as in *L. filiforme*, but more frequently branched at the base, 1 to $1\frac{1}{2}$ in. long, with rather distant spikelets. Lowest outer bract with a short subulate lamina, the others more glumelike but striate. Spikelets linear-acuminate, straight or falcate, erect or spreading, about 4 lines long, with 1 barren flower besides the perfect one. Flowering glumes almost acute, about 4 outer empty ones very obtuse and gradually shorter. Scales under the nut acuminate, not setiferous.

Victoria. Queenscliff and Mount Sturgeon, *F. Mueller*; Mount Sturgeon, *Robertson*.

S. Australia. Mount Lofty Ranges and Lake Alexandrina, *F. Mueller*.

Perhaps a variety of *L. gracile*, but with much larger and fewer spikelets. Closely allied also to *L. canescens*, but the leaves, though very narrow, usually quite flat.

SECTION V. TERETICAULES.—Stems slender, terete or angular-striate, or slightly and irregularly compressed. Leaves nearly similar.

24. *L. pubisquameum*, *Steud. Syn. Glum.* ii. 158.—Stems slender but rigid, 1 to $1\frac{1}{2}$ ft. high, nearly terete or angular and furrowed on one side. Leaves similar but shorter. Panicle contracted into a dense ovoid or almost globular compound cluster rarely $\frac{1}{2}$ in. long, the subtending bract subulate from a sheathing base, usually erect throwing the inflorescence to one side. Spikelets densely crowded in the partial clusters, about 2 lines long in our specimens but not yet fully out, with 1 barren flower besides the perfect one. Glumes scarcely acute, 5 or 6 outer empty ones more obtuse and gradually shorter. Scales and nut not yet developed in the specimens.—*F. Muell. Fragm.* ix. 27.

W. Australia, *Drummond*, n. 250 (350 according to *Steudel*).

25. *L. canescens*, *Bœckel.* in *Linnaea*, xxxviii. 330.—Stems 1 to 2 ft. high, terete or very slightly compressed, smooth. Leaves much shorter, terete but usually grooved along the inner side. Panicle pyramidal, not very compound, 1 to 2 in. long, the branches slightly

spreading. Spikelets sessile along the branches, not very distant, erect or spreading, linear, acuminate, sometimes slightly falcate, 3 to $3\frac{1}{2}$ lines long, with 1 barren flower besides the perfect one. Flowering glumes rather acute, about 4 outer empty ones obtuse or very shortly mucronate, gradually shorter. Scales under the nut acuminate, not setiferous.—F. Muell. *Fragm.* ix. 24.

Victoria. Near Portland, between Queenscliff and Geelong, and Genoa River, *F. Muell.*

S. Australia. Gawler River, *Behr*; Mount Lofty Ranges and Lake Alexandrina, *F. Muell.*

F. Muell.'s specimens come very near to *L. semiteres*, but the leaves are not flattened. *Behr*'s specimens are generally stouter, with rather larger spikelets, but one of them is quite like *F. Muell.*'s.

26. **L. scabrum**, *Nees in Pl. Preiss.* ii. 92.—Stems 1 to $1\frac{1}{2}$ ft. high, terete, prominently striate and in the typical form very scabrous. Leaves shorter, otherwise similar but more slender, and frequently somewhat flattened. Panicle dense, 1 to 2 in. long, oblong-ovoid or broad, the branches and spikelets spreading. Outer involucre bract short. Spikelets crowded along the short branches, about 2 lines long, with 1 barren flower besides the perfect one. Flowering glumes acuminate, almost acute, 3 or 4 outer empty ones shorter and more obtuse. Scales under the nut acuminate, not setiferous.—*F. Muell. Fragg.* ix. 27.

W. Australia. *Drummond*, n. 105, 114, 871; Swan River, *Preiss*, n. 1787, 1788.

Var. *effusum*. Stems not so scabrous and sometimes quite smooth except at the base, but always prominently striate. Panicle not so dense, 2 to 3 in. long, with spreading branches. Spikelets not so crowded and frequently curved.—Swan River, *Oldfield*, *Drummond*, n. 270, 869; Murchison River, *Oldfield*.

27. **L. tenue**, *Benth.*—Stems 1 to $1\frac{1}{2}$ ft. high, exceedingly slender, smooth and terete but slightly furrowed on one side. Leaves filiform, slightly angular or terete, shorter than the stem. Panicle compound, 1 to 3 in. long, broad or rather narrow, with spreading or slightly recurved branches. Spikelets clustered or singly sessile along the branches, acuminate, straight or falcate, 2 lines long or rather more, with 1 barren flower besides the perfect one. Glumes obtuse or the inner ones acute, about 3 outer empty ones gradually shorter. Scales under the nut acuminate, not setiferous.

W. Australia. *Drummond*, n. 120, 121, 868, 869, 885, 886, 895; Murchison River, *Oldfield*, and, perhaps, the same but in bud only; Karri Dale, *Walcot*.

Varies very much in the panicle compact with short branches and crowded spikelets, or loose with slender branches and the spikelets rather distant.

28. **L. leptostachyum**, *Benth.*—Stems 1 to $1\frac{1}{2}$ ft. high, very slender, terete and smooth or slightly angular and furrowed on one side. Leaves few, much shorter than the stem, angular or nearly terete.

Panicle 1 to 3 in. long, either reduced to a simple spike, or with 3 or 4 erect or scarcely spreading branches near the base. Outer bracts sheathing, with very short points. Spikelets singly sessile along the branches or slightly clustered, about 2 lines long or rather more, acuminate, black, mostly erect and straight, with 1 barren flower besides the perfect one. Glumes acute, the inner ones acuminate, about 3 outer empty ones gradually shorter. Scales under the nut acuminate, not setiferous.

W. Australia, *Drummond*, n. 352, 892; Kalgan River, *F. Mueller*; Forest Hill, *Muir*; Tone River, *Oldfield*; Blackwood River, *Miss Hexter*.

29. **L. leptophyllum**, *Benth.*—Stems filiform, usually about 1 ft. high, terete, prominently striate. Leaves very slender, angular or prominently ribbed, some much longer than the stem, others shorter. Panicle interrupted, 1 to 1½ in. long with few branches, the lowest usually erect, the rhachis above it very much recurved reflexed or flexuose. Lowest outer bract subulate, usually longer than the inflorescence. Spikelets clustered or singly sessile along the branches, about 2 lines long, with 1 barren flower besides the perfect one. Glumes obtuse or the inner ones scarcely acute, 2 outer empty ones shorter. Scales under the nut acuminate, not setiferous, the nut rather small.

W. Australia, *Drummond*.

30. **L. tortuosum**, *F. Muell. Fragm.* ix. 23.—Stem filiform, under 1 ft. high, nearly terete or slightly angular and furrowed on one side. Leaves often nearly as long, filiform, grooved like the stem. Spike simple, short with a very flexuose rigid rhachis. Spikelets usually 3, the lowest erect with a rigid bract often longer than itself, the others reflexed or spreading, linear, dark brown, 2 to 2½ lines long, with 1 barren flower besides the perfect one. Flowering glumes rather acute, about 3 outer empty ones very obtuse and gradually shorter. Scales under the nut acuminate, not setiferous.

Victoria. Mount Wellington, Gipps' Land, *F. Mueller*.

31. **L. flexuosum**, *R. Br. Prod.* 235.—Stems very slender, terete or nearly so, 2 ft. high or more. Leaves few, short and subulate, with long sheaths. Spike or panicle 1 to 2 in. long, branched at least at the base, the rhachis very flexuose. Sheathing bracts narrow, rigid, obtuse or with very short points. Spikelets solitary within the bracts, rather distant along the branches, at first erect but afterwards spreading, linear-terete, 4 to 5 lines long, with 1 barren flower besides the perfect one. Glumes narrow, acute or acuminate, about 3 outer empty ones shorter. Scales under the nut not aristate.—*Nees* in *Sieb. Agrostoth.* n. 43; *Boeckl.* in *Linnaea*, xxxviii. 328.

N. S. Wales. Port Jackson, *R. Brown*, *Woolfs*, and many others.

32. **L. filiforme**, *Labill. Pl. Nov. Holl.* i. 17, t. 15.—Stems terete,

filiform but rigid, 1 to $1\frac{1}{2}$ ft. high. Leaves few, much shorter, mostly reduced to rather long sheaths with short capillary laminæ. Spike simple, terminal, rarely above 1 in. long, the rhachis straight or scarcely flexuose. Sheathing bracts narrow, distant. Spikelets solitary within each bract, narrow-linear, almost terete, about 4 lines long, with 1 barren flower besides the perfect one. Glumes narrow, acute or almost obtuse, 2 or 3 outer empty ones shorter. Scales under the nut acuminate, but not setiferous.—Hook. f. Fl. Tasm. ii. 93, partly; Bœckl. in Linnæa, xxxviii. 327; F. Muell. Fragm. ix. 27.

Victoria. Mount Wellington, Gipps' Land, *F. Mueller*; Curdies Inlet, *Walter*.

Tasmania. Arthur's Lake, *Gunn*; Brown River, *Oldfield*; South Esk River, *C. Stuart*; Swanport, *Story*.

33. ***L. striatum*, R. Br. Prod. 235.**—Stems rigid, 2 ft. high or more, terete or slightly compressed and furrowed on one side, quite smooth and but very faintly striate. Leaves shorter, terete or nearly so. Panicle narrow and spikelike but interrupted, usually 3 or 4 in. long, the spikelets densely crowded on the short branches in secondary oblong compound spikes, all erect and sessile within the sheathing bracts or one of the lowest shortly pedunculate. Glume-like bracts dark brown or black, rather broad, tapering to a point. Spikelets about 3 lines long, with usually 2 or 3 barren flowers besides the perfect one. Glumes acute or acuminate, 1 or 2 outer empty ones very little shorter. Scales scarcely perceptible at the time of flowering, narrow acuminate and not very thick under the nut.—*L. confine*, Nees in Pl. Preiss. ii. 93; F. Muell. Fragm. ix. 26.

W. Australia. King George's Sound, *R. Brown*; Forest Hill, *Muir*; north of Stirling Range, *Maccul*; Swan River, *Preiss*, n. 1794; also *Drummond*, n. 252, 380; his specimens n. 257 may be a large stout form with the panicle looser, its branches more developed, but the flowers are in too young a state to determine. Brown's specimens are in fruit with the lower spikes or branches of the panicle rather long, the stems are quite smooth, slightly grooved on one side but not distinctly striate as in *L. scabrum*, the selection of the specific name is therefore unfortunate.

Bœckler, Linnæa, xxxviii. 329, unites this species with the *L. chinense*, Nees, which is certainly nearly allied to it as well as to the *L. Neesii*. The Chinese plant has however differently shaped bracts, much smaller hypogynous scales, and a few other distinctive characters, which would be scarcely considered as specific were it not for the geographical disseverance. At any rate Brown's name has the right of priority.

34. ***L. Neesii*, Kunth, Enum. ii. 319.**—Stems slender but rigid, 1 to 2 ft. high, angular or terete and grooved on one side. Leaves shorter, terete or rather flatter and more distinctly grooved. Panicle dense and spikelike, oblong or pyramidal, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, brown or black, the spikelets in dense sessile clusters or short spikes within each bract. Bracts striate, acuminate, the lowest sometimes with a subulate lamina or point nearly as long as the inflorescence. Spikelets oblong-linear, $2\frac{1}{2}$ to 3 lines long, with 1 barren flower besides the perfect one. Glumes narrow, acute or acuminate, 2 or 3 outer empty ones rather

shorter. Scales under the nut ovate, acuminate and sometimes shortly setiferous.—F. Muell. Fragm. ix. 27; *L. tetragonum*, Nees in Sieb. Agrostoth. n. 49, not of Labillardière.

N. S. Wales. Port Jackson, *F. Mueller*, *Woolfs*, *Leichhardt*.

Victoria. Streletzki Ranges and Wilson's promontory, *F. Mueller*.

F. Mueller, Fragm. ix. 24, refers some of the specimens with shorter denser spike-like panicles to the New Zealand *L. australe*, Hook. f., but besides some minor differences, that species has never (in a number of spikelets I have examined) the second barren flower, which I have found in all the Australian species of *Lepidosperma*.

35. *L. carphoides*, F. Muell. Herb.—Stems slender, terete, usually grooved on one side, about 1 ft. high. Leaves similar but shorter. Panicle dense and spike-like, rarely above 1 in. long, the spikelets few in short sessile partial spikes. Sheathing bracts usually as long as the enclosed partial spikes, rigid, black, acute or produced into a subulate point or short lamina. Spikelets narrow, black, 4 to 5 lines long, with 1 barren flower besides the perfect one. Glumes narrow, rigid, acutely acuminate or almost aristate, usually 2 outer empty ones, the lowest rather shorter. Scales under the nut ovate-lanceolate acuminate.—*L. striatum*, F. Muell. Fragm. ix. 27, not of R. Br.

Victoria. Glenelg River, *Robertson*; Portland Bay and Grampians, *F. Mueller*; Moyston, *Sullivan*.

S. Australia. St. Vincent's Gulf, *F. Mueller*, *Blandourki*; Boston Point, *Wilhelmi*, Port Lincoln, *S. F. Browne*.

W. Australia. King George's Sound, *Menzies*; Point Henry, *Oldfield*.

24. *CLADIUM*, P. Br.

(*Baumea*, *Gaudich.* *Chapelliera*, *Nees*.)

Spikelets variously paniculate, with 1 to 3 hermaphrodite flowers but usually the lowest alone fertile. Glumes few, imbricate all round, 1 to 3 or very rarely 4 outer ones empty, and usually a small one above the perfect flower, either empty or with an imperfect flower, the flowering glume not shorter than the outer empty ones. No hypogynous bristles. Stamens 3 or rarely fewer. Style deciduous, sometimes dilated at the base but continuous with the ovary; stigmatic branches 3, rarely 2, filiform. Nut ovoid or oblong, terete or obtusely triquetrous, smooth but rarely shining, crowned by the adnate base of the style often undistinguishable except by a slight discoloration; endocarp usually hard, exocarp either thin or more or less thickened and corky especially at the apex.—Perennials, with horizontal or creeping rhizomes. Stems sometimes tall and leafy throughout or at the base only, sometimes rush-like with all the leaves reduced to sheathing scales. Leaves, either terete, and continuous or marked with transverse septa, or vertically flattened, very rarely with the involute margins of *Gahnia*.

The genus in its typical form extends over the tropical and temperate regions of both the New and the Old World, but consists of but two or at most three species





amongst which the Australian one is common over a great part of the generic area; but the more numerous section *Baumea* is probably limited to the Old World and is chiefly Australasian. Of the 15 Australian species five are also in New Zealand and one or two of these extend to some of the Pacific islands, the other ten appear all to be endemic.

SECT. I. **Eucladium**.—*Panicles densely corymbose. Outer empty glumes about 4. Flowers 2, 1 or rarely both fertile, and usually no terminal empty glume.*

Stems tall, leafy throughout. Leaves flat 1. *C. mariscus*.

SECT. II. **Baumea**.—*Panicles loose or thyrsoid or narrow. Outer empty glumes 1 to 3, and usually a small terminal glume either empty or with a rudimentary flower. Leaves chiefly at the base of the stem or none.*

Spikelets 2- or 3-flowered (flowers all apparently perfect but only one fertile).

Leaves 6 ft. (flat?). Panicle broad, loose, with very numerous spikelets 2. *C. insulare*.

Leaves terete, transversely septate. Panicle very large, somewhat drooping. Spikelets very numerous but not clustered. Glumes not ciliate 3. *C. articulatum*.

Leaves terete, septate. Panicle erect, rigid. Spikelets scarcely clustered. Glumes ciliate 4. *C. arthrophyllum*.

Leaves terete, continuous or obscurely septate. Panicle erect, rigid. Spikelets densely clustered. Glumes ciliate 5. *C. glomeratum*.

Leaves vertically flattened. Stems much flattened. Glumes not ciliate. Western species.

Stems 3 to 4 ft. Leaves broad. Panicle often 1 ft. long 6. *C. Preissii*.

Stems 1 to 2 ft. Leaves narrow. Panicle 2 to 4 in. 7. *C. laxum*.

Spikelets 1-flowered.

Panicles thyrsoid or loosely branched, erect. Leaves few long and erect. Spikelets numerous.

Leaves biconvex, 2 to 3 lines broad. Panicle long and loose 8. *C. riparium*.

Leaves terete, about 1 line broad. Panicle thyrsoid 9. *C. teretifolium*.

Leaves angular or flat with a prominent midrib, 1 to 2 lines broad. Panicle thyrsoid 10. *C. tetraquetrum*.

Panicle narrow, almost spikelike or with few erect branches.

Spikelets few. Nut smooth and shining.

Leaves vertically flattened but narrow. Stem under 1 ft. 11. *C. schænoides*.

Stems leafless except short points to the sheaths, usually above 1 ft. high, rarely intermixed with a few radical stemlike leaves.

Flowering glume spreading, twice as long as the nut 12. *C. Gunnii*.

Flowering glume appressed, about as long as the nut.

Stems slender, 1 to 2 ft. high 13. *C. junceum*.

Stems stout, 3 ft. high or more 14. *C. vaginale*.

Leaves erect, terete, acute. Stem $\frac{3}{4}$ to $1\frac{1}{2}$ feet 15. *C. elynanthoides*.

Spikelets densely crowded in the axils of leafy bracts, forming a long narrow almost spikelike panicle.

Leaves and bracts with involute margins and long subulate panicle. Nut narrow triquetrous 16. *C. filum*.

SECTION I. EUCLADIUM.—Panicles densely corymbose. Flowers in the spikelet usually 2, one only or rarely both fertile, without any terminal empty glume or only a very minute one. Stem leafy throughout with flat leaves.

1. *C. mariscus*, *R. Br.*; *Kunth, Enum.* ii. 303.—Stems 3 to 6 ft. high, terete, leafy throughout and often producing tufts of leaves or leafy branches from the upper axils. Leaves nearly erect, flat, the keel and edges scabrous, the lower nearly as long as the stem. Panicles compound and corymbose in the upper axils, the whole forming a leafy panicle often above 1 ft. long. Spikelets exceedingly numerous, in small but numerous clusters, brown, ovoid or oblong, scarcely 2 lines long in the Australian specimens, longer in some northern ones, very small in others. Glumes broad, obtuse, about 4 outer empty ones gradually shorter than the flowering ones. Flowers usually 2, both hermaphrodite, or one (the lower or sometimes the upper one) male, and rarely both fertile, and I have only very rarely seen a terminal minute empty glume. Stamens 2 or rarely 3. Style-branches 3 or rarely 2. Nut nearly as long as the glumes, almost drupaceous, the exocarp thick especially the upper end and sometimes corky, the endocarp much shorter and hard.—*Bœckel. in Linnæa*, xxxviii. 232; *Reichb. Ic. Fl. Germ. t.* 287; *F. Muell. Fragm.* ix. 14.

Queensland. Rockhampton, *Thozet*; Bowen Downs, *Birch*.

N. S. Wales. Port Jackson and Blue Mountains, *R. Brown*, *Woolfs* and others.

Victoria. Port Phillip, *R. Brown*; Yarra River, *Adamson*, *F. Mueller*; Warramboul, *Sullivan*.

S. Australia. Tamunda, *Behr*; Lofly Range, Torrens River, *F. Mueller*.

Widely dispersed over the tropical regions of the New and the Old World and over more temperate Asia and Europe, in North America replaced by a nearly allied species.

SECTION II. BAUMEA.—Panicles loose or thyrsoïd or narrow. Flowers in the spikelet solitary, or if 2 or 3 the lower one only fertile, with usually a small terminal glume either empty or with a rudimentary flower. Leaves chiefly at the base of the stem, terete or vertically flattened, or all reduced to sheathing scales (except *C. insulare*?).

In respect of general habit, inflorescence, and to a certain degree in the structure of the spikelets, the genus *Baumea*, *Gaud.*, or *Chapelliera*, *Nees*, might have been retained, but all attempts to characterise the two by the shape and surface of the nut have failed, and I have followed *Hooker* and *F. Mueller* in restoring the greater part of *Baumea* to *Cladium* as a section. In some species the angles of the nut, very prominent after the nut has attained its full size, become obliterated at perfect maturity, and the external rugosity or smoothness, and the broad or small terminal discoloration caused by the remains of the adnate base of the style can only serve for specific distinctions. The distribution of the species between the two genera adopted by *Bœckeler* does not appear to me to be justified either by habit or character.

2. **C. insulare**, *Benth.*—"Leaves 5 to 6 ft. long; flower-stem 2 ft. higher" (*C. Moore*). Panicle much-branched, erect or rather flexuose, 6 to 8 in. long and nearly as broad. Primary bracts loosely sheathing, striate, the lowest with a sheath of about 1 in. produced into a flat point or lamina nearly as long, the upper ones gradually smaller, more acute or aristate, passing into the glumelike bracts subtending the spikelets. Spikelets very numerous and crowded but not distinctly clustered, of a rich brown, about 2 lines long. Outer empty glumes 2 or 3, acute or acuminate, scarcely aristate, the lowest the shortest. Flowers 2 or 3, all hermaphrodite but probably only one fertile, their glumes about as long as the empty ones but narrower, and a small terminal glume either empty or with a rudimentary flower. Stamens 3. Style-branches 3. Fruit not seen.

N. S. Wales. Lord Howe's Island, side of Mount Lingbird, *C. Moore*. The specimens seen consist of panicles only, but indicate a species very different from any other known to me, approaching perhaps in some respects the *C. articulatum*, though the flat points to the bracts indicate flat blades to the leaves.

3. **C. articulatum**, *R. Br. Prod.* 237.—Stems 3 to 6 ft. high, terete but marked with more or less distinct transverse septa almost disappearing below the panicle. Leaves erect, terete and stemlike, the transverse septa very prominent, the lower ones very long, the upper ones shorter with long continuous closed sheaths. Panicle very compound, somewhat nodding, 1 to 1½ ft. long, the very numerous branches and peduncles clustered within sheathing bracts, of which the lowest often produced into a terete acute septate lamina of 1 to 2 in. Spikelets exceedingly numerous, brown, about 2 lines long, with 3 to 5 hermaphrodite flowers, but usually only the lower one fertile. Glumes broad, membranous, acute, the upper ones gradually narrower and more obtuse but not shorter, 2 or rarely 3 outer ones empty and sometimes almost aristate, and the terminal one usually small empty or with an imperfect flower. Stamens 3. Style-branches 3, short. Nut obovoid, at first triquetrous, the broad obtusely conical or ovoid solid apex often as long as the nucleus or endocarp.—*F. Muell. Fragm.* ix. 14; *Baumea loculata*, *Bœckel. in Linnæa*, xxxviii. 243.

Queensland. Rockingham Bay, *Dallachy*; Bowen Downs, *Birch*; Brisbane River, Moreton Bay, *F. Mueller, Leichhardt* and others.

N. S. Wales. Port Jackson and Hunter's River, *R. Brown*; Paramatta, *Woolfs*; New England, *C. Stuart*.

Victoria. On the Yarra, *Adamson, Robertson, F. Mueller*; Lake Terang, *F. Mueller*; Mount William Creek, *Sullivan*.

S. Australia. Onkaparinga, *F. Mueller*.

W. Australia. King George's Sound, *R. Brown, Macwell*, and thence to Swan River, *Drummond*, n. 358 or 858, and Murchison River, *Oldfield*.

Also in New Zealand and in New Caledonia.

4. **C. arthropphyllum**, *F. Muell. Fragm.* ix. 14.—Very closely allied to the subseptate variety of *C. glomeratum*, and intermediate as it were between that and *C. articulatum*. Stems terete or slightly

compressed, $1\frac{1}{2}$ to 2 ft. high. Leaves 2 or 3 at the base of the stem, rather long, erect, terete, irregularly septate or almost continuous, with long broad open sheaths, the upper sheaths produced into short slender acute usually septate points or laminæ, and some flowering stems entirely without the long leaves. Panicle much looser than in *C. glomeratum*, very compound, the small spikelets very numerous and approximate, scarcely clustered but erect as in *C. glomeratum* or nearly so. Glumes ciliate and nuts entirely as in that species.—*Chapelliera arthropphylla*, Nees in Pl. Preiss. ii. 77; *Baumea arthropphylla*, Bæckel. in Linnæa, xxxviii. 242.

W. Australia. Swan River, *Preiss*, n. 1781, according to Nees, n. 1778 in the collections seen, *Drummond*, n. 324 or 333.

5. **C. glomeratum**, *R. Br. Prod.* 237.—Stems 1 to 3 ft. high, terete, rather slender. Lower leaves few, erect, terete, 6 in. to 1 ft. long or more, dilated into short sheaths, a few inner ones with longer sheaths and shorter laminæ. Spikelets in ovoid or nearly globular dense clusters 3 to 4 lines in diameter, the lower clusters in a partial narrow pedunculate panicle, the upper ones on short and long peduncles clustered in the axils of the sheathing bracts, the uppermost sessile in a more compound cluster, the whole forming a narrow irregular panicle. Sheathing bracts mostly open to the base, the upper ones small and glumelike. Spikelets oblong, brown, 2 to 3 lines long. Glumes membranous, broad, ciliate, acuminate, 2 or 3 outer ones empty. Flowers usually 2, sometimes 3, all hermaphrodite or the upper one male and usually only the lower one fertile. Stamens 3. Style-branches 3. Nut ovoid-oblong, nearly as long as the glume, when unripe with 3 raised angles and crowned by the pubescent base of the style, when ripe the angles are nearly obliterated and the nut is shining (red in Brown's specimens) the base of the style scarcely distinct except as an opaque apex.—*Kunth*, Enum. ii. 304; *Sieb. Agrostoth.* n. 4; *Hook. f. Fl. Tasm.* ii. 94; *F. Muell. Fragm.* ix. 15; *C. dubium*, Nees in *Sieb. Agrostoth.* n. 5, *Spreng. Syst. Cur. Post.* 21; *Baumea rubiginosa*, and *B. Brownii*, Bæckel. in Linnæa, xxxviii. 241, 242.

N. Australia. Newcastle Range and Gilbert River, *F. Mueller*.

Queensland. Moreton Bay and Island, *M'Gillivray*, *F. Mueller*, *Bailey*; Rockhampton, *Thozet*; Bowen Downs, *Birch*.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, n. 535 and many others; New England, *C. Stuart*; Archer's Station, *Leichhardt*; Liverpool Plains, *C. Moore*.

Victoria. Numerous localities from Portland and Wendu Vale to Gipps' Land, *Robertson*, *F. Mueller* and many others.

Tasmania. Abundant in clayey sandy moist places, *J. D. Hooker* and others.

S. Australia. Rivoli Bay, *F. Mueller*.

W. Australia. King George's Sound, *R. Brown*.

Var *subseptatum*. Leaves obscurely or irregularly marked with transverse septa, but the spikelets in dense erect clusters and other characters of *C. glomeratum*. To this belong several of the Victorian and Tasmanian specimens.

The species is also in New Zealand, and the *Baumea glomerata*, *Gaud. in Freye. Voy. Bot.* 416, t. 29, from the Moluccas, appears from the plate to differ but very slightly from it. I have however seen no specimen.

6. **C. Preissii**, *F. Muell. Herb.*—Stems 3 to 4 ft. high, much flattened with rather acute edges below the inflorescence, the flowering branches becoming 3-angled when more than one from the same sheath. Radical leaves few, very long, vertically flat, with acute edges, 2 to 9 lines broad. Upper sheathing scales flat with very acute edges and short erect laminæ, the floral ones gradually smaller. Panicle long loose and very compound, the branches and pedicels clustered. Spikelets very numerous, distinct or scarcely clustered, of a rich brown, small but young in Preiss's specimens, ovoid-oblong and 2 to $2\frac{1}{2}$ lines long when fully out, usually with 2 or 3 hermaphrodite flowers and a terminal male flower or empty glume. Glumes rather broad, acute, loosely imbricate, thin, without the cilia of *C. glomeratum*, 1 or 2 outer ones empty, the flowering ones fully as long. Stamens 3. Style-branches 3. Nut ovoid-oblong, the summit or dilated base of the style glabrous like the rest.—*Baumea Preissii*, Nees in Pl. Preiss. ii. 75; Bœckel. in Linnæa, xxxviii. 239; *C. latissimum*, F. Muell. Fragm. ix. 15.

W. Australia. Swan River, *Drummond*, *Preiss*, n. 1735; Port Gregory and Murchison River, *Oldfield*.

7. **C. laxum**, *Benth.*—Stems 1 to 2 ft. high, much flattened. Leaves at the base of the stem equitant, vertically flat, sometimes as long as the stem but usually much shorter, straight or falcate, acute, 1 to 3 lines broad. Panicle loose, thyrsoïd, 2 to 4 in. long or sometimes the lower branches distant and pedunculate in the lower sheathing bracts, which are very flat and produced into short erect acute laminæ, the upper bracts gradually smaller and more glume-like. Spikelets erect, rather numerous but all distinct and frequently pedicellate, of a rich brown, about 2 lines long or rather more, with 2 or rarely 3 hermaphrodite flowers, one only fertile and a small male flower or empty glume above them. Glumes broadly lanceolate, acute, 2 outer empty ones shorter than the flowering ones. Stamens 3. Style-branches 3. Nut small, obovoid, crowned by the white adnate base of the style.—*Chapelliera laxa*, Nees in Pl. Preiss. ii. 76; *Baumea laxa*, Bœckel. in Linnæa, xxxviii. 245.

W. Australia. King George's Sound, *Preiss*, n. 1763, *Maxwell*, *Oldfield*; Swan River, *Preiss*; Murchison River, *Oldfield*. Evidently very closely allied to *C. Preissii*, although placed by Nees in a different genus on account of the adnate base of the style being more distinct, at least in the specimens seen, than in that species.

8. **C. riparium**, *Benth.*—Stems $1\frac{1}{2}$ to 2 ft. high or more, much flattened. Leaves few at the base of the stem and as long, 2 to 3 lines broad, much flattened but biconvex in the lower part, with obtuse edges, ending in a flat point, those higher on the stem or sometimes all reduced to loose sheaths with short erect points, passing into the sheathing floral bracts. Panicle narrow, loosely compound, 6 to 10 in. long, the lower branches or partial panicles pedunculate in the sheathing bracts. Spikelets in erect clusters as in *C. glomeratum*, but rather smaller; glumes ciliate as in that species, but with only one herma-

phrodite flower and a male one or empty glume above it. Nut not yet ripe in the specimens seen, 3-angled, crowned by the large very pubescent base of the style.—*Chapelliera riparia*, Nees in Pl. Preiss. ii. 76; *Baumea riparia*, Bœckel. in Linnæa, xxxviii. 246,

W. Australia. *Drummond*, n. 386, and according to Nees, *Preiss*, n. 1778, but the specimens I have seen under that number belong to *C. arthropphyllum*. The *C. riparium* is however easily recognised by Nees's characters.

9. *C. teretifolium*, R. Br. Prod. 237.—Stems 1 to 3 ft. high, terete or slightly compressed, striate but not angular. Leaves few, rather long, terete, acute, erect, with long loose sheaths, the inner one with a short lamina. Panicle oblong or thyrsoid, dark brown, 2 to 6 in. long, erect and much branched, but usually dense and narrow. Lowest bract a loose membranous sheath with a short erect point, the others gradually smaller and more glume-like. Spikelets numerous, sessile, 2 to 2½ lines long, with 1 hermaphrodite flower. Glumes membranous, keeled, acutely acuminate, ciliate, usually 3 empty, the outer one short, and a small glume either empty or enclosing a male flower above the flowering glume and within it. Stamens 3. Nut (only seen in the Moreton Bay specimens) obovoid-globular, 1½ lines long, with many much raised longitudinal ridges, smooth for a very short space at the base, and crowned by the scarcely distinct adnate base of the style.—Bœckel. in Linnæa, xxxviii. 234; F. Muell. Fragm. ix. 15; Sieb. Agrostoth. n. 6.

Queensland. Sandy Cape, *R. Brown*; Brisbane River, Moreton Bay, *F. Mueller*.

N. S. Wales. Port Jackson and neighbourhood, *R. Brown*, *Woolls* and others.

Also in New Zealand.

10. *C. tetraquetrum*, Hook. f. Fl. Tasm. ii. 95, t. 149.—Stems 1 ft. high or more, scarcely compressed, striate and often angular. Leaves few, rather long, rarely above 1 line broad, rigid, somewhat flattened and striate, with a raised midrib on each side, or in larger specimens acutely 4-angled, the inner leaf reduced to a long sheath with a short lamina. Panicle oblong or thyrsoid, dark brown, 1½ to 4 in. long, dense throughout or interrupted at the base. Outer bract a loose membranous sheath with a short erect point, the others gradually smaller and more glume-like. Spikelets sessile, usually numerous, 2 to 2½ lines long, with 1 hermaphrodite flower. Glumes membranous, keeled, acutely acuminate, ciliate, usually 3 empty, the outer one short, and a small glume either empty or enclosing a male flower above the flowering glume and within it. Stamens 3. Nut obovoid, 1½ lines long, marked with raised ridges or reticulations, shortly smooth at the base, crowned by the more or less distinct adnate base of the style.—Bœckel. in Linnæa, xxxviii. 235; *Lepidosperma tetragona*, Labill. Pl. Nov. Holl. i. 17, t. 17.

N. S. Wales? New England, *C. Stuart*. Nuts triquetrous and smooth but not quite ripe, otherwise appears the same species.

Tasmania. Common in moist places throughout the island, *J. D. Hooker* and others.

S. Australia. Mount Lofty Ranges, *F. Mueller*.

Var. ? *planifolium*. Leaves flat, 1 to 2 lines broad, strongly striate, with a prominent midrib on each side. Inflorescence, bracts, 1-flowered spikelets, nuts, etc. quite as in the normal *C. tetraquetrum*, except that the spikelets are almost clustered, approaching those of *C. glomeratum*.

N. S. Wales. New England, *C. Stuart*.

Victoria. Goulburn and Upper Hume Rivers, *F. Mueller*.

F. Mueller, *Fragm.* ix. 15, proposes to unite this and the following *C. schœnoides* with *C. teretifolium*. They appear to me however to be constantly distinct, although nearly allied. I have not seen any authentic specimen of Labillardière's *Lepidosperma tetragonum*, but the plate quoted so exactly represents the *Cladium tetraquetrum* that I feel no doubt as to its identity. The minute hypogynous scales described by those who have seen specimens are probably the scars left by the fallen stamens, and certainly not the thickened spongy scales so universal in *Lepidosperma*.

11. **C. schœnoides**, *R. Br. Prod.* 237.—Stems 6 in. to 1 ft. or rarely $1\frac{1}{2}$ ft. high, more or less flattened. Leaves at the base of the stem equitant, longer or shorter, vertically flattened, striate but without any raised midrib, rigid, straight or falcate, very acute, rarely above 1 line broad. Panicle narrow, 1 to $1\frac{1}{2}$ in. long, almost spike-like but flexuose and interrupted. Lower bracts with a short sheath and erect rigid acute lamina, sometimes very short, sometimes 1 to 2 in. long, the upper bracts gradually smaller and more glume-like. Spikelets few, somewhat clustered, all sessile, about 2 lines long, 1-flowered. Glumes acute or acuminate, erect, slightly striate, scarcely ciliate, 3 outer ones empty of which the lowest short, and above the flowering glume and enclosed within it a small empty one rarely including a male flower. Stamens 3. Style-branches 3. Nut ovoid, very slightly compressed, very obtuse, dark-coloured, about 1 line long, smooth and shining when ripe, and often hanging by the persistent filaments as in several *Gahniæ*.—*Hook. f. Fl. Tasm.* ii. 96; *Schœnus acutus*, Labill. Pl. Nov. Holl. i. 18, t. 18; *S. falcatus*, Nees in Sieb. *Agrostoth.* n. 18; *Baumea schœnoides*, Bœckel. in Linnæa, xxxviii. 246.

N. S. Wales. Port Jackson and neighbourhood, *R. Brown*, *Woolfs*, *C. Moore* and others.

Victoria. On the Yarra, *F. Mueller*; Mount William Flats, *Sullivan*.

Tasmania. Dry heathy places, *Gunn*, *Archer* and others.

W. Australia. *Drummond*, n. 331; Perongerup, *F. Mueller*.

Var. *elongatum*. Stems and leaves often 1 ft. or more, the panicle longer, the outer sheathing bract with a very short lamina.

Queensland. Moreton Island, *F. Mueller*.

12. **C. Gunnii**, *Hook. f. Fl. Tasm.* ii. 95, t. 148.—Stems slender but rigid, terete, from under 1 to 2 ft. high or even more, leafless except sheathing scales at the base or with one long terete stem-like leaf and occasionally a few similar radical leaves intermixed in the tuft. Panicle narrow, interrupted, with few erect branches, sometimes almost spike-like. Lower sheathing bract with a short subulate or rarely a longer leaflike point, the upper ones gradually smaller and more glume-like. Spikelets sessile, distinct, somewhat distant, 1-flowered. Glumes rather rigid, erect at first but spreading when in fruit, the flowering one narrow lanceolate, acutely acuminate, often 3 lines long,

2 outer empty ones shorter broader with fine points, the terminal empty glume very small or deficient. Stamens 3. Nut ovoid, at first prominently 3-ribbed, quite smooth and shining when ripe, tipped with the small adnate base of the style.—Bœckel. in Linnæa, xxxviii. 235; F. Muell. Fragm. ix. 15; *C. laxiflorum*, Hook. f. l. c.; *Gahnia sulcata*, F. Muell. First Gen. Rep. 20; *Schœnus punctatus*, Nees in Sieb. Agrostoth. n. 19; *S. nudus*, Steud. Syn. Glum. ii. 165; *Cladium nudum*, Bœckel. in Linnæa, xxxviii. 236.

N. S. Wales. New England, *C. Stuart*.

Victoria. Muddy Creek, Buffalo Range, between Curdie's River and the Gellibrand, *F. Mueller*; Mount William, *Sullivan*.

Tasmania. Near Formosa, *Gunn*; near New Norfolk, *Oldfield*; Mersey River and Evansdale, *C. Stuart*.

S. Australia. Mount Lofty Range, *F. Mueller*.

Sieber's specimens are smaller than the generality of the southern ones, but they agree with the common form in the spreading glumes and all other characters. The species is also in New Zealand.

13. **C. junceum**, *R. Br. Prod.* 237.—Stems slender but rigid and rush-like, from under 1 to above 2 ft. high, leafless except a few distant closed sheaths with a very small erect or spreading lamina, or sometimes only 2 or 3 sheaths at the base. Spike-like panicle short, terminal, $\frac{1}{2}$ to a little more than 1 in. long; the subtending sheathing bract very small. Spikelets few, somewhat flattened, of a rich brown, about 2 lines long, sessile along the short branches, each within a broad prominently 5- or 7-nerved glume-like bract, and containing a single hermaphrodite flower. Glumes almost distichous, acute, with prominent ciliate keels, the sides membranous, 2 or 3 outer empty ones shorter, the flowering glume erect, and above it and enclosed within it a small thin terminal glume, with usually a male flower. Stamens 3. Nut obovoid, nearly as long as the glume, very obtuse.—Bœckel. in Linnæa, xxxviii. 237; Hook. f. Fl. Tasm. ii. 95; F. Muell. Fragm. ix. 16.

Queensland. Burnett River, *F. Mueller*.

N. S. Wales. Port Jackson, *R. Brown*, *Woolfs*; New England, *C. Stuart*, *Leichhardt*; Hastings River, *Beckler*; Clarence River, *Wilcox*.

Victoria. Port Philip, *R. Brown* and others; Queenscliff, Darebin Creek, *F. Mueller*; French Island, *Beveridge*.

Tasmania. *R. Brown*; abundant in wet, sandy, and heathy places in the northern parts of the island, *J. D. Hooker*.

S. Australia. St. Vincent's Gulf, *F. Mueller*; Port Lincoln, *J. S. Browne*.

W. Australia. King George's Sound, *Maxwell*; Canning, Swan, and Murchison Rivers, *Oldfield*; Busselton, *Pries*.

Also in New Zealand.

C. pauciflorum, *R. Br. Prod.* 237, from Port Jackson, appears to be a variety of this species, differing in the points of the leaf-sheaths being shortly subulate instead of very short and rather obtuse.

14. **C. vaginale**, *Benth.*—Stems stout, terete below the inflorescence, 3 ft. high or more, leafless except 1 or 2 long loose sheaths at the base ending in erect points, one often 6 in. long. Panicle long

narrow and interrupted, with few erect branches. Spikelets few, fully 2 lines long, resembling those of *C. junceum*, and the structure apparently the same but our specimens too far advanced. Outer empty glumes 2 or 3, acute, the keels not ciliate, the lower one rather shorter; flowering glume as long, more obtuse, with a small inner one above it enclosing an imperfect flower. Nut obovoid, obtusely triquetrous, nearly as long as the glume, at first granular, at length smooth and shining.

W. Australia. Drummond, n. 73; King George's Sound, F. Mueller; Busselton, Preiss.

15. **C. elynanthoides**, F. Muell. *Fragm.* ix. 31.—Stems terete, rigid but slender, from under 1 ft. to $1\frac{1}{2}$ ft. high. Leaves at the base of the stem shorter, rigid, erect, acute, terete and slightly channelled along the inner side, the brown sheathing bases shorter and open. Panicle narrow, consisting of few erect strict almost spike-like branches or partial panicles. Primary bracts with long half open sheaths and leaf-like terete subulate laminæ, the upper ones small, those of the partial panicles mostly glume-like. Spikelets distinct, sessile, erect, 2 to $2\frac{1}{2}$ lines long. Glumes acutely acuminate, about 4 empty, the outer one rather shorter. Flowering glume as long, with a perfect hermaphrodite flower, and above and within it either a minute empty glume or a longer one with a more or less perfect but sterile flower. Stamens 3. Nut oblong, obscurely triquetrous, as long as the glumes. —*Elynanthus australis*, Nees in Ann. Nat. Hist. ser. 1, vi. 48, and in Pl. Preiss. ii. 79.

W. Australia. Drummond, 1st coll. and n. 113 and 890; York district, Preiss, n. 1789.

16. **C. filum**, R. Br. *Prod.* 237, partly.—Stems from a creeping rhizome 2 to 4 ft. high, rigid but not stout, leafy throughout. Leaves with involute scabrous margins ending in long subulate points often longer than the stem, the radical ones with dark brown more or less open sheathing bases, those on the stem with long closed sheaths, passing into the bracts. Inflorescence a long narrow very dense leafy panicle, consisting of very compound dense oblong or thyrsoid partial panicles of 1 to $1\frac{1}{2}$ in., the lower ones on very short erect peduncles in the axils of distant long leaf-like bracts, the upper ones sessile in a narrow thyrsoid or spike-like panicle, the subtending bracts gradually shorter and passing into the glume-like bracts subtending the ultimate clusters and spikelets. Spikelets very numerous and crowded, 2 to $2\frac{1}{2}$ lines long, narrow, pale-coloured. Empty glumes 1 or 2, narrow, acute, often minutely pubescent, the flowering one almost obtuse, and sometimes a smaller glume above it, either empty or with an imperfect sterile flower. Stamens 3. Nut narrow-oblong, triquetrous, pale-coloured, 2 to 3 lines long and not above $\frac{1}{2}$ line broad.—Hook. f. Fl. Tasm. ii. 96; *Schænus filum*, Labill. Pl. Nov. Holl. i. 18, t. 19; *Baumea longifolia*, Bæckel. in Linnæa, xxxviii. 244.

Victoria. Melbourne, *Adamson*; Portland, *Allitt*; St. Kilda and Queenscliff, *F. Mueller*.

Tasmania. Derwent River, *R. Brown*; Near Hobarton, *Gunn*; Swanport, *Storv*.

S. Australia. Port Adelaide and other localities on St. Vincent's Gulf, *F. Mueller*, *Blandowski*.

The habit and inflorescence are so nearly those of *Gahnia trifida*, that the specimens of the two have often been confounded, and *R. Brown*'s character appears to have been chiefly taken from the latter.

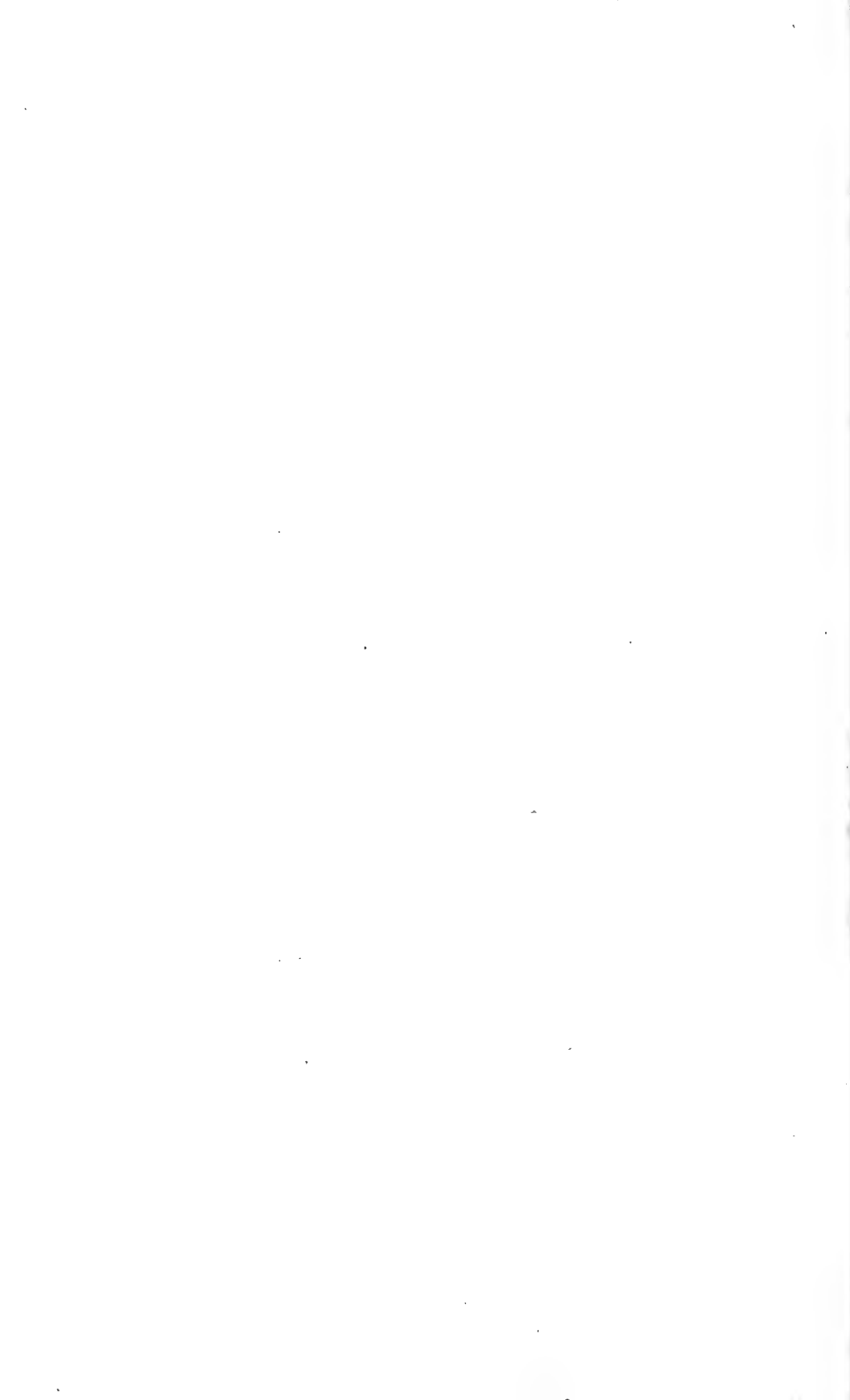
25. GAHNIA, Forst.

(*Morelotia*, *Gaudich.* *Lampocarya*, *R. Br.*)

Spikelets variously paniculate, with 1 hermaphrodite flower and usually 1 male flower below it. Glumes several, imbricate all round, 4 or more outer ones empty, the flowering glumes shorter, broad, obtuse and closely enveloping the flowers and nut, without any empty glume above the flower. No hypogynous bristles. Stamens 3 or more, frequently 4 to 6. Style deciduous, continuous with the ovary; stigmatic branches in the perfect flower 3 to 5 (or 3 with 1 or 2 bifid), filiform. Nut obovoid ovoid or almost fusiform, obscurely or not at all 3-angled, usually smooth and shining when fully ripe, the endocarp hard, smooth or transversely rugose inside, the exocarp but little thickened.—Perennials with a hard or creeping rhizome. Stems sometimes very tall, in a few species shorter and slender. Leaves terete and furrowed along the inside or with involute margins so as to appear terete, always ending in long subulate points. Panicles either large loose and drooping, or long and erect or spike-like. Spikelets black or in a very few species brown. Filaments in some species becoming very much lengthened. Nuts in several species of a bright brown-red, in others black, grey, or almost white, and frequently after having been cut remaining hanging to the spikelet by the filaments, persistent at their base, and retained at the other end by the closely involute margins of the inner empty glumes.

The genus extends to New Zealand, the Malayan Archipelago and the Pacific islands. Of the Australian species, one appears to be general over a great part of the area, the others are all endemic.

Gahnia, generally admitted by recent botanists as generically distinct from *Cladium*, has been recently united with it by *F. Mueller*, and certainly, as between *Gahnia* and the section *Baumea* of *Cladium*, neither the nut nor the stamens afford any constant distinctive characters, and in some few cases the habit of species of the two groups is the same. Yet it appears to me that if the species are properly distributed, there really are two groups in which the structure of the spikelet is sufficiently distinct in principle to entitle them to rank as generic, accompanied as it is by other characters which though not absolutely constant are very general. In *Baumea*, as in most *Rhynchosporæ*, the flowering glume is as long as or longer than the outer empty ones, which are usually 2 only or at most 3 in number; where there are two flowers it is the lowest one that is fertile, and above the flower or flowers there is almost always a small glume either empty or with an imperfect flower. In *Gahnia* there are several (4 or more) outer empty glumes of which one of the inner ones is the longest, the one or two flowering glumes are much shorter, and the fertile flower terminates the spikelet, there being no imperfect flower above it. *Baumea* never has more than





three stamens, many *Gahniæ* have from 4 to 6. The peculiar foliage of *Gahnia* is exemplified in one species only of *Baumea*, some other characters, such as the black spikelets, long filaments, etc., though common in *Gahnia* are less constant. Almost all species of *Gahnia* have also a peculiarity which requires perhaps in some cases further verification, but which I have never observed in *Baumea*. There are generally two flowers, the lowest, usually very precocious, has perfect stamens with an abortive pistil, the terminal one, always later and sometimes very much so, has both organs always perfect. I believe this to be the case with the species of *Eugahnia*, but in some I may have been deceived by a certain degree of unisexuality. Although I have been able to examine a large number of specimens of most species, and the spikelets are generally exceedingly numerous, yet those of each specimen are generally in the same stage of development. In some the anthers of the lower male flower are protruding beyond the glumes, whilst the upper hermaphrodite flower is still so small as to be almost regarded as rudimentary, in others the terminal flower has its nut ripe or nearly so, and the filaments of the lower one are hanging loosely about or have entirely fallen away. It is very rarely therefore that I have been able satisfactorily to follow the development of the perfect flower from the very young bud to the nearly ripe fruit..

In the section *Lampocarya*, including the Sandwich Island *Morelotia*, Gaudich. the lower male flower is usually deficient, and although there is no imperfect flower above the fertile one, which thus as in other *Gahniæ* usually terminates the spikelet, there is sometimes a small empty glume above the flower, thus forming a group intermediate as it were between *Cladium* and *Gahnia* as suggested by Brown, but much nearer to the latter than to the former.

SECT. I. *Lampocarya*.—Spikelets with a single terminal hermaphrodite flower or very rarely with a second male or imperfect one.—Panicle long and narrow, the spikelets in compound clusters or short spikelike branches, sessile or shortly pedunculate along the main rhachis.

- | | |
|---|----------------------------|
| Spikelets 3 to 4 lines long. Flowering glumes broad and very obtuse. Nuts about 3 lines long. Stamens usually 6 | 1. <i>G. aspera</i> . |
| Spikelets under 2 lines. Nuts 1 to 1½ lines long. Clusters of spikes globular. Glumes aristate. Stamens 4 to 6 | 2. <i>G. trifida</i> . |
| Clusters of spikelets at first oblong. Glumes broad, shortly acuminate. Stamens 3, rarely 4 | 3. <i>G. melanocarpa</i> . |

SECT. II. *Eugahnia*.—Spikelets with a terminal hermaphrodite flower and a precocious male or barren one below it.—Panicles (except in *G. Sieberi*) loose, narrow, thyrsoid or spreading.

- | | |
|--|-------------------------------|
| Panicles long and narrow. Leaf-sheaths not bearded. Spikelets densely clustered in short spikelike branches. Leaves at the base of the stem long, scabrous, with straight points | 4. <i>G. Sieberi</i> . |
| Spikelets very small in a long loose narrow panicle. Leaves long, scabrous, with straight points | 5. <i>G. microstachya</i> . |
| Spikelets small in loose narrow spikelike branches. Leaves along the slender stems, smooth, with hooked or recurved points | 6. <i>G. polyphylla</i> . |
| Panicles narrow, erect. Spikelets small. Leaf-sheaths bearded at the orifice with woolly hairs. Spikelets distinct or nearly so. Leaves smooth, with hooked or recurved points | 7. <i>G. ancistrophylla</i> . |
| Leaves smooth, with subulate erect points | 8. <i>G. lanigera</i> . |
| Spikelets clustered. Leaves with erect points. Leaves smooth | 9. <i>G. aristata</i> . |
| Leaves scabrous | 10. <i>G. deusta</i> . |
| Panicles thyrsoid, very compound, with erect branches. Inner glumes almost hoodshaped. | |

- Panicle very black, 3 to 6 in. long. S. Eastern species. 11. *G. radula*.
 Panicle usually 1 to 1½ ft. long. Western species . . . 12. *G. decomposita*.
 Panicle large, with spreading or drooping branches.
 Outer empty glumes acuminate or aristate, not much shorter than the inner.
 Panicle dense. Nuts at length red. 13. *G. tetragonocarpa*.
 Panicle loose and drooping. Nuts at length black . 14. *G. xanthocarpa*.
 Outer glumes numerous, short, obtuse or slightly acuminate. 15. *G. psittacorum*.

SECTION I. *LAMPOCARYA*.—Spikelets with a single terminal hermaphrodite flower, or rarely with a second male or imperfect one. Panicle long and narrow, the spikelets in compound clusters or short spikelike branches, sessile or shortly pedunculate along the main rhachis.

1. *G. aspera*, *Spreng. Syst. ii.* 114.—Stems rigid, 2 to 3 ft. high. Leaves very long, with involute scabrous margins, becoming almost terete, with long subulate points. Clusters of spikelets very dense, in short compound sessile spikes in the axils of the upper or floral leaves, forming a dense spikelike slightly interrupted leafy panicle. Lower leafy bracts very long, with short sheaths, the upper gradually shorter with broad lanceolate bases, the inner bracts more glume-like. Spikelets mostly about 4 lines long, with a single hermaphrodite flower. Empty glumes 7 or 8, the outer ones narrow, acuminate or aristate, with rigid ciliate keels passing into a few inner shorter very broad and obtuse membranous ones, the flowering glume still thinner and shorter at the time of flowering. Stamens usually 6, rarely 5 or 4. Style-branches 3, all simple or one divided nearly to the base. Nut ovoid-oblong to almost globular, often 3 lines long, slightly mucronate with the base of the style, very smooth, shining and brown red when fully ripe, but in some specimens (unripe?) pale straw-coloured, at first closely enveloped in the 2 inner glumes, but at length forced out and remaining long suspended by the filaments persistent at the base of the nut and caught at the other end in the points of the longest empty glumes.—Bœckel. in *Linnæa*, xxxviii. 344; *Lampocarya aspera*, R. Br. Prod. 238; *Cladium asperum*, F. Muell. Fragm. ix. 12.

N. Australia. Taylor's Range, *F. Mueller*.

Queensland. Keppel Bay, Broad Sound and Shoalwater Bay, *R. Brown*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*, *Thozet*; Ipswich, *Nernst*; Moreton Bay, *Leichhardt*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolfs*; Peel's Range, *A. Cunningham*; Hastings River, *Beckler*; Macleay River, *C. Moore*; Richmond River, *Mrs. Hodgkinson*; Clarence River, *Wilcox*; southward to Illawarra, *A. Cunningham*.

Also the same or a very closely allied species in New Caledonia and the Fiji Islands; and the Sandwich Island, *G. globosa*, *H. Mann*, or *G. mucronata*, Bœckel. may also be not really distinct.

Hexalepis scabrifolia, Bœckel. in *Flora*, 1875, 118, from Brisbane River, *Amalia Dietrich*, appears to me to be that state or variety of *G. aspera*, in which the nuts of a straw-colour or rarely dark brown and opaque are not yet forced out of the spikelets and remain sessile and erect. In some instances specimens from N. S. Wales as

well as from Queensland with straw-coloured sessile nuts, and others with brown shining exserted hanging nuts have been sent as belonging to one species.

2. **G. trifida**, Labill. *Pl. Nov. Holl.* i. 89, t. 116.—Stems rigid, 2 to 4 ft. high. Leaves often as long, almost terete, with scabrous involute margins ending in long subulate points, the floral ones gradually smaller. Clusters of spikelets very dense, in short compound spikelike partial panicles, the lower ones shortly pedunculate, the upper ones sessile, forming a long narrow thyrsoid or spikelike leafy panicle like that of *Cladium filum*, but the clusters or partial panicles usually shorter and broader. Spikelets very numerous in the clusters, scarcely 2 lines long, with a single hermaphrodite flower. Glumes brown or black, broad, acutely acuminate, and the outer ones more aristate than in *Cladium filum*, with rigid erect points, often slightly scabrous on the keel and margins; outer empty ones about 4, gradually shorter, the innermost completely enveloping the flower, and rarely a small additional glume with a second imperfect flower. Stamens 4 to 6. Style-branches 3, but one often deeply divided so as to appear 4. Nut obovaid-oblong, not angled, 1 to $1\frac{1}{2}$ lines long and 1 line broad, very obtuse, usually dark coloured when ripe.—*Cladium filum* (partly), R. Br. *Prod.* 237, Boeckel. in *Linnaea*, xxxviii. 233; Nees in *Pl. Preiss.* ii. 87; F. Muell. *Fragm.* ix. 14, not of Labill.; *Lampocarya hexandra*, R. Br. *Prod.* 238.

Victoria. Albert River, Gipps' Land and Wilson's Promontory, F. Mueller.

Tasmania. Derwent River, R. Brown; Southport, C. Stuart; Swanport, Story.

W. Australia. King George's Sound, Muir; Swan River, *Preiss.* n. 1780, Drummond, n. 901; Murchison River, Oldfield.

Var. *effusa*. Panicle more branched and looser.—Kojonerup, Maxwell.

This species, though so closely allied in structure to *G. aspera* and *G. melanocarpa*, has so much the aspect of *Cladium filum* as to have been mistaken for it by Brown and others, specimens of the two being mixed in his herbarium, and his character derived chiefly if not entirely from the *Gahnia*. He had indeed failed to recognise Labillardière's plant, which he rightly refers (from the figure and description) to his genus *Lampocarya*. After sorting out the numerous specimens of both in Mueller's and other herbaria I have found the 3 stamens and long narrow 3-angled straw-coloured nut of *C. filum*, and the 4 to 6 stamens and short obtuse obovaid dark-coloured nut of *G. trifida*, quite constant, besides that *G. trifida* may be generally distinguished without examination by the clusters of spikelets shorter, broader, more dense and more aristate than in *C. filum*.

3. **G. melanocarpa**, R. Br. *Prod.* 239.—Stems usually several feet high. Leaves very long, with involute scabrous margins, ending in long subulate points, the floral ones gradually smaller, all rigid and erect. Panicle narrow and dense, often above 1 ft. long and interrupted at the base, very compound, with erect spikelike or thyrsoid branches, the lower ones 2 to 4 in. long, the upper much shorter, very narrow when in flower, broader and denser when in fruit. Smaller bracts shortly aristate, those under the spikelets almost glume-like. Spikelets very numerous, more or less clustered, scarcely above $1\frac{1}{2}$ lines long. Outer empty glumes about 3, acuminate and almost aristate, 1 or 2

inner ones also empty, and the flowering glume thinly membranous, almost hyaline, obtuse and closely enveloping the single hermaphrodite flower, without any second male flower or inner empty glume in the specimens examined. Stamens 3 or rarely 4, at length much elongated. Nut small, obovoid or ovoid, black and shining when quite ripe.—*Cladium melanocarpum*, F. Muell. Fragm. ix. 13.

N. S. Wales. Port Jackson, *R. Brown*; northward to New England, *C. Stuart*; Hastings River, *Beckler*, *C. Moore*; near Bulli, *Johnson*; southward to Nangatta Range, Twofold Bay, *F. Mueller*.

SECT. II. EUGAHNIA.—Spikelets with a single terminal fertile hermaphrodite flower and a second male, or if hermaphrodite sterile, below it and often very precocious. Panicle loose, either long and narrow or thyrsoïd or very much branched and spreading or nodding, excepting *G. Sieberi*, which has nearly the inflorescence of *Lampocarya*.

4. **G. Sieberi**, *Bæckel. in Linnæa*, xxxviii. 343.—Stems terete, 2 ft. high or more. Leaves long, with involute scabrous margins, ending in long subulate points, the outer ones with short broad black open sheaths, the upper ones with long closed sheaths. Panicle very compound, narrow, thyrsoïd, black, often above 1 ft. long, the branches erect, the lower ones rather long, the upper short, with numerous oblong or spikelike clusters of spikelets. Lower bracts with long subulate leafy points or laminæ, the upper ones gradually smaller and the secondary ones passing into glume-like bracts subtending the spikelets. Spikelets densely clustered, 3 to 4 or even 5 lines long. Empty glumes about 5, keeled, mucronate acuminate or the lower ones aristate, the flowering glumes shorter, obtuse, and at first very thin and hyaline. Flowers 2, both apparently hermaphrodite, but the lower precocious one always sterile, the terminal one developed usually much later and alone fertile. Stamens in all the flowers examined 4. Style-branches 3, undivided. Nut oblong, smooth, 3-angled.—*Didymonema filifolia*, Presl, Diss. 1829 and Symb. Bot. 6, t. 3, and on his authority *Epiandra teretifolia*, Presl, in Isis. 1828; *Gahnia psittacorum*, Nees in Sieb. Agrostoth. n. 13, not of Labill; *Melachne Sieberi*, Schrad., according to Nees in Ann. Nat. Hist. ser. 1, vi. 50; *Caustis Sieberi*, Kunth, Enum. ii. 307; *Cladium Sieberi*, F. Muell. Fragm. ix. 14.

N. S. Wales. Port Jackson to the Blue Mountains, *Woolfs*, *Sieber*. The habit approaches that of *G. melanocarpa*, but the characters are rather those of the following species.

5. **G. microstachya**, *Benth.*—Stems $1\frac{1}{2}$ to 2 ft. high, slender, terete. Leaves few at the base of the stem and nearly as long, with scabrous involute margins, ending in long subulate terete straight points, the brown sheaths rather long and not bearded. Panicle narrow and slender, nearly 1 ft. long, the long erect slender branches mostly distant, but 2 or 3 together from the same sheath. Lower sheathing bracts with very long subulate laminæ, the upper ones small,

the secondary ones almost glume-like, but all aristate. Spikelets the smallest in the genus, all distinct, sessile or pedicellate, scarcely 1 line long. Glumes about 3 empty, acuminate, the outer 1 or 2 shorter. Flowering glumes about as long as the innermost empty one or the upper one shorter. Flowers 2, both of them hermaphrodite, the lower one sterile, the upper one (very small when the other is out) fertile. Stamens 3 or in most of the flowers examined 4. Style-branches 3, undivided. Nut oblong, obtusely triquetrous, obtuse, rather shining, about as long as the glume.

N. S. Wales. Barren situations north of Bathurst, *A. Cunningham*.

Victoria. Higher drier parts of the Avon Ranges, *F. Mueller*.

6. **G. polyphylla**, *Benth.*—Stems slender, 1 to 1½ ft. long, leafy throughout. Leaves subulate, smooth and ending in long recurved or revolute points as in *G. ancistrophylla*, but much shorter and inserted all along the stem, the sheaths oblique at the orifice and not bearded. Panicle narrow and almost spikelike, interrupted, 2 to 3 in. long, the branches short and erect. Lower bracts with subulate points, those under the spikelets glumelike and rarely aristate. Spikelets dark brown, not clustered, under 2 lines long. Glumes ovate, the outer ones acute or with short points, the upper ones obtuse. Flowers 2, hermaphrodite, the upper one alone fertile. Stamens 5 or 6. Style-branches 3, undivided. Nut not seen.

W. Australia, *Drummond*, n. 102, 253.

7. **G. ancistrophylla**, *F. Muell. Herb. (as a Cladium).*—Stems slender, tufted, from under 1 ft. to 1½ ft. high. Leaves chiefly at the base of the stem and sometimes nearly as long, subulate, smooth, ending in long hooked or recurved points, the brown sheaths bearded at the orifice with woolly hairs. Panicle long and narrow, sometimes occupying more than half the stem, with numerous short erect or slightly spreading branches. Spikelets dark brown, numerous, almost clustered, scarcely 2 lines long, the subtending bracts glume-like and not longer, or a few with awns slightly exceeding the spikelet. Glumes acute, scarcely aristate, 6 to 9 empty, the outer ones shorter, the flowering ones obtuse and membranous, the inner one small. Flowers 2, both hermaphrodite, the upper one alone fertile. Stamens 3 or very rarely 4. Style-branches 3, undivided. Nut not seen.

W. Australia, *Drummond*, n. 349. Upper Kalgan River, *F. Mueller*.

8. **G. lanigera**, *Benth.*—Stems slender, 8 in. to above 1 ft. high. Leaves mostly shorter, quite smooth, subulate, tapering into long fine erect points, the dark brown rigid sheaths densely bearded at the orifice with woolly hairs, the upper ones passing into the sheathing bracts. Panicle slender and narrow, 4 to 6 in. long, the branches or partial panicles all erect, the bracts under the spikelets glume-like and scarcely longer than them. Spikelets 1½ to 2 lines long, not clustered.

Empty glumes 5 or 6, narrow, acuminate, almost aristate, the outer ones scarcely shorter. Flowering glumes acute or obtuse, the inner one small and membranous. Flowers 2, both hermaphrodite, the upper one alone fertile. Stamens usually 3, but sometimes 5. Style-branches 3, undivided. Nut ovoid-oblong, smooth.—*Cladium lanigerum*, R. Br. Prod. 237; F. Muell. Fragm. ix. 14.

S. Australia. Port Lincoln, R. Brown, J. S. Browne; St. Vincent's Gulf, F. Mueller.

W. Australia. Drummond; Point Irwin, Oldfield. The leaves in these specimens are rather longer and the stems taller than in the South Australian ones. To them appears referrible *Cladium medium*, R. Br. l. c. from King George's Sound, but the flowers on his specimens are still very young. In Oldfield's specimens I find generally 5 stamens but in Drummond's there are 3 only as in the South Australian ones.

9. **G. aristata**, F. Muell. Herb. (as a *Cladium*).—Stems terete, 1 to 2 ft. high. Leaves crowded at the base of the stem, long, subulate, terete, and often channelled but quite smooth, with long straight fine points, the brown sheaths bearded at the orifice with woolly hairs. Panicle long, narrow, almost spikelike but interrupted, the lowest branches distant, generally 2 or 3 of the partial panicles sessile or shortly pedunculate within the sheath and all erect. Lowest bract with a long brown sheath and erect subulate lamina often exceeding the inflorescence, the upper bracts shorter, those under the clusters with fine rigid awns much exceeding the spikelets. Spikelets dark brown, densely clustered, 2 to 3 lines long. Empty glumes all acuminate or aristate, the outer ones scarcely shorter, the flowering glumes shorter and obtuse. Flowers 2, both hermaphrodite, but the upper one alone fertile. Stamens 3. Nut not seen.

W. Australia. Drummond, n. 889; Upper Kalgan River, Oldfield; Upper Hay River, F. Mueller, Miss Warburton.

10. **G. deusta**, Benth.—Stems terete, 1 ft. high or rather more. Leaves shorter or nearly as long, with scabrous involute margins ending in long subulate erect points, the brown or black sheaths bearded at the orifice with woolly hairs. Panicle long, narrow, compound, the partial erect spikelike panicles 1 to 2 in. long, 2 or 3 together from the sheathing bracts, the lower ones pedunculate, the upper sessile. Primary bracts long and subulate with black sheaths, the uppermost and secondary ones gradually smaller and passing into the glume-like acuminate or aristate bracts subtending the spikelets, all more or less bearded on the margins especially near the base. Spikelets about 3 lines long, narrow-lanceolate. Empty glumes 3 or 4, long and narrow, acutely acuminate, slightly ciliate or bearded on the margins or nearly glabrous, the 2 inner glumes membranous, the innermost small and hyaline. Flowers 2, both hermaphrodite, but the upper one alone fertile. Stamens usually 6. Style-branches in the perfect flower 3, undivided. Nut ovoid-oblong, obtusely triquetrous, obtuse, smooth but not shining.—*Cladium deustum*, R. Br. Prod. 237; F. Muell. Fragm. ix. 14.

S. Australia. Memory Cove, *R. Brown*; Port Lincoln, *J. S. Browne*; Lake Alexandrina, *F. Mueller*.

11. **G. radula**, *Benth.*—Stems $1\frac{1}{2}$ to 3 ft. high. Leaves very long, with involute scabrous margins, ending in long subulate points. Panicle compound, thyrsoid, black, usually 3 to 6 in. long, but sometimes much longer, with numerous erect branches. One or two lower bracts with long subulate leafy points or laminæ, the others gradually smaller and more glume-like. Spikelets very numerous, black, not clustered, erect, narrow, 2 to 3 lines long. Glumes altogether 6 to 8, 2 or 3 outer ones empty acute or acuminate, the inner empty ones shorter and obtuse, and the almost hood-shaped flowering ones closely enveloping the flowers. Flowers 2, both hermaphrodite, but the upper one alone fertile. Stamens 3. Style-branches 3, undivided. Nut ovoid, obtuse, $1\frac{1}{4}$ lines long, 3-ribbed, elegantly but minutely granular or at length shining.—*Cladium radula*, *R. Br. Prod.* 237; *F. Muell. Fragm.* ix. 13; *Gahnia melanocarpa*, *Hook. f. Fl. Tasm.* ii. 97, not of *R. Br.*

Victoria, chiefly about Melbourne, *Robertson*, *Adamson*, *F. Mueller* and others; French Island, *Beveridge*.

Tasmania. Derwent River, *R. Brown*; Hobarton, *Gunn*; Swanport, *Herb. F. Mueller*.

There seems to be much diversity in the degree of development of the inner glumes, but I have been unable to ascertain whether this is due to the stage of flowering of the specimens or to distinct varieties. Sieber's specimens, *Agrostoth.* n. 11, erroneously named by Nees *Cladium filum*, may belong to *G. radula*, but the spikelets are still too young for determination and I have seen no specimen of the species from the parts of N. S. Wales where Sieber collected.

12. **G. decomposita**, *Benth.*—Stems "in dense tussacs 6 to 9 ft. high" (*Oldfield*). Leaves very long, rigid, with involute very scabrous margins, ending in long subulate points, the floral ones gradually smaller. Panicle black or dark brown, very compound, rather loose but above 1 ft. long, the branches very numerous and erect. Lower bracts with very long subulate leaflike points or laminæ, the upper gradually smaller, those under the ultimate spikes or clusters of spikelets lanceolate, aristate-acuminate, much longer than the clusters, those under each spikelet glume-like. Spikelets very numerous, in little spikes or clusters along the branches, each spikelet about 2 lines long. Empty outer glumes 2 or 3, tapering into points, the keel ciliate or pubescent, the 2 flowering glumes much shorter, broadly obovate-spathulate, obtuse and very concave, almost hood-shaped. Flowers 2, both hermaphrodite but only the upper one fertile, and the two so close together as to be almost taken for one. Stamens in each 4 to 6. Nut obovoid, obtuse, closely enveloped in the flowering glumes till perfect maturity.—*Cladium decompositum*, *R. Br. Prod.* 237; *Gahnia Preissii*, Nees in *Pl. Preiss.* ii. 87; *Cladium Preissii*, *F. Muell. Fragm.* ix. 13.

W. Australia. King George's Sound, *R. Brown*, *Oldfield*, *F. Mueller*; Swan River, *Preiss.* n. 1806, *Drummond*, n. 76. In these Swan River specimens the bracts

are not so broad and the awns finer, and they are therefore not so conspicuous as in the typical ones. F. Mueller refers Drummond's n. 259 to the same species, but the specimens are not in a state to be determined satisfactorily.

13. **G. tetragonocarpa**, *Bæckel. in Linnæa*, xxxviii. 347.—Stature and foliage the same as in *G. psittacorum*, and panicle as large with spreading branches and exceedingly numerous spikelets, but the spikelets often not so black or brown and broader, at first oblong, ovoid when fully out. Empty glumes 3, 4 or rarely 5, acute or aristate, the outer ones not much shorter than the inner. Flowering glumes obtuse, the inner one short, very thin and membranous. Flowers in the spikelets examined 2, the outer one male with 4 stamens, the inner one hermaphrodite with 3 stamens, but the two so close together that they appear like one flower with 7 stamens, most of them on one side of the ovary, but the number of stamens may not be constant. Style-branches 3. Nut ovoid, brown or red, at length smooth and shining.

Victoria. Muddy Creek, *F. Mueller*; Mount William Creek, *Sullivan*; Mount Imlay, *Lockhart Morton*.

14. **G. xanthocarpa**, *Hook. f. Handb. N. Zeal. Fl.* 306.—Stems 8 to 9 ft. high. Leaves 5 to 6 ft. long, with involute very scabrous margins, ending in long subulate points. Panicle large and loose, often above 1 ft. long, the very numerous branches turned to one side and more or less drooping, the lower ones often 6 in. long or more. Lower bracts with long subulate leafy points, upper ones mostly with close sheaths and short points but very variable. Spikelets very numerous, sessile but not closely packed, nearly 3 lines long. Empty glumes 6 to 8, aristate; flowering ones shorter, very thin, with short points. Flowers 2, the outer one male with a minute rudimentary pistil, the inner one hermaphrodite and fertile. Stamens 4; filaments very long. Style-branches 3, undivided. Nut ovoid-oblong, light coloured or black, smooth and shining when quite ripe.—*Cladium xanthocarpum*, *F. Muell. Fragm.* ix. 13.

N. S. Wales. Lord Howe's Island, *Milne*, *McGillivray*, *C. Moore*, *Fullagar*. Also in New Zealand.

15. **G. psittacorum**, *Labill. Pl. Nov. Holl.* i. 89, t. 115.—Stems stout, terete below the inflorescence, 4 to 8 ft. high. Leaves long, with very scabrous involute margins, ending in long subulate points. Panicle often 1 to 2 ft. long, very black, oblong or thyrsoïd, often one-sided, very compound, the numerous branches spreading drooping or nearly erect. Lower sheathing bracts produced into long subulate scabrous leaflike points or laminae, the upper ones gradually smaller. Spikelets exceedingly numerous, 2 to 3 lines long. Empty glumes in the typical forms 10 to 12, very obtuse or rarely almost acute, the outer ones very small but gradually increasing in length; flowering glumes much smaller, thinly membranous and very obtuse, the innermost one often minute. Flowers 2, but so close together as to appear within the

same glume, outer one male and very precocious, the inner one hermaphrodite and fertile. Stamens in each 4 or rarely 5 or 6; filaments moderately or very long after flowering. Style-branches usually 4 of equal length, but one of them deeply divided so as to appear 5, at least in the rather numerous flowers examined. Nut ovoid, hard, very smooth and shining, of a rich brown red when quite ripe or rarely pale straw-colour, 2 lines long in the larger Tasmanian form scarcely above half as long in some varieties.—R. Br. Prod. 238; Hook. f. Fl. Tasm. ii. 97; Boeckl. in Linnæa, xxxviii. 345; *Cladium filum* and *C. radula*, Nees in Sieb. Agrostoth. n. 11 and 12, not of R. Br.; *Cladium psittacorum*, F. Muell. Fragm. ix. 13; *G. Sieberiana*, Kunth, Enum. ii. 332.

N. S. Wales. Port Jackson, *S. White*, *Sieber*, n. 536, *Woolfs* and others; Cowan's Creek, *Fitzgerald*; Newcastle, *Leichhardt*; Hastings River, *Beckler*; Richmond River, *Mrs. Hodgkinson*.

Victoria. Portland, *Allitt*.

Tasmania. Abundant throughout the island, *J. D. Hooker*; King's Island, *Neate*.

S. Australia. Rivoli Bay, *F. Mueller*.

W. Australia. ? There is a specimen in the Hookerian herbarium marked King George's Sound, *Collie*, but as there is no other specimen in our herbaria from that well-searched locality it is probable there is some mistake.

The species, easily distinguished among all the large black paniced ones, by the number of short closely imbricate outer glumes, is very variable in the apex of these glumes more or less obtuse, in the length to which the filaments protrude after losing their anthers, and especially in the size of the nuts. In the larger typical Tasmanian form, of which I have only seen a very few N. S. Wales specimens, the nut is about 2 lines long. In the majority of the N. S. Wales specimens and a few of the southern ones the spikelets are smaller, the glumes rather less obtuse, the stamens usually but not always less conspicuous and the nuts very much smaller, but there are many intermediate specimens. It is to these small red-fruited forms that belongs the *G. erythrocarpa*, R. Br. l. c. 239, from Port Jackson. *G. leucocarpa*, R. Br. l. c. from King's Island, Bass's Straits, is nearly the same but the fruits are pale-coloured, perhaps not ripe. I should also, from the descriptions, refer to the small-fruited Port Jackson forms, the *G. Urvilleana*, Kunth, Enum. ii. 332, and *G. gonio-carpa*, Steud. Syn. Glum. ii. 164.

Var. ? *oxylepis*. Glumes rather fewer and more acuminate, but I can find no other difference.

Queensland. Rockingham Bay, *Dallachy*; Moreton Bay, *F. Mueller*.

N. S. Wales. New England, *C. Stuart*.

26. CAUSTIS, R. Br.

(Eurostorrhiza, Steud.)

Spikelets with 1 hermaphrodite flower and often 1 male one below it, narrow, sometimes unisexual by abortion. Glumes 3 or 4, imbricate all round the rachis, acuminate or aristate, 1 or 2 outer empty ones shorter. No hypogynous bristles or scales. Stamens 3 to 6. Style slender, with a thick hard persistent base; stigmatic branches 3, filiform. Nut ovoid or oblong, crowned by the hard ovoid or oblong

base of the style, sometimes as big as itself, and either continuous with it or slightly contracted under it.—Stems from a perennial rhizome with thick fibrous roots, usually leafless except sheathing-scales like those of *Restiaceæ* but closed, very rarely produced into linear-subulate leaves, more or less paniculately branched, the branches either erect and straight or numerous curved flexuose or revolute, the short sterile branchlets and peduncles clustered within each sheath. Spikelets sometimes unisexual by abortion, the males and females on separate stems though proceeding from the same rhizome.

The genus is endemic in Australia. Some specimens assume so much the aspect of some species of *Hypolana* (*Restiaceæ*) as to be occasionally confounded with them in herbaria.

Spikelets (constantly?) hermaphrodite and uniform. Beak or appendage to the nut large and distinct.

Flowering branches erect and straight. Spikelets sessile or shortly pedunculate. Stamens usually 5 (4 to 6)

Pedicels slender, solitary or few together in clusters of curved flexuose or involute branchlets. Stamens 3.

Spikelets unisexual by abortion, the males and females on separate stems. Appendage to the nut small or conical and quite continuous.

Sheathing scales not ciliate, tapering to a point. Eastern species.

Female pedicels rigid, recurved, in clusters of flexuose or involute branchlets. Stamens 5 or 6

Female pedicels short, on slender erect or scarcely flexuose branches. Stamens usually 4

Sheathing scales and bracts truncate and ciliate, with rigid spreading or leaflike points or laminæ. Stamens 5 or 6

1. *C. pentandra*.

2. *C. flexuosa*.

3. *C. recurvata*.

4. *C. restiacea*.

5. *C. dioica*.

1. ***C. pentandra***, *R. Br. Prod.* 240.—Stems 2 ft. high or more, terete below the branches, but the branches when 2 or more in a cluster flattened or excavate along the inner side with acute angles, the whole cluster terete. Flowering branches long and erect; clusters of barren ones few and often 3 to 4 in. long, erect or slightly curved. Sheathing scales usually tapering into long points. Spikelets rather numerous, erect, usually a sessile and pedunculate one from the same sheath, 6 to 8 lines long, all apparently equally fertile. Glumes rigid, minutely pubescent, with long subulate points or awns. Stamens 5 in the hermaphrodite flower, often 2 or 3 only in the male one. Persistent style-base oblong, furrowed, pubescent, larger than the nut.—Hook. f. *Fl. Tasm.* ii. 98; F. Muell. *Fragm.* ix. 19; *Eurostorrhiza Urvillei*, Steud. *Syn. Glum.* ii. 265.

N. S. Wales. Port Jackson, *R. Brown, Sieber*, n. 36, *J. D. Hooker*; in the north-west interior, *A. Cunningham*; Cowan's Creek, *Fitzgerald*.

Victoria. Glenelg River, *Robertson*; Mount William, *Sullivan*; Gipps' Land, *F. Mueller*.

Tasmania. Sandy heaths, northern part of the island, *Gunn*; Swanport, *Story*.

W. Australia. Lucky Bay, *R. Brown*. Some specimens of *Drummond*, n. 344, in a bad state, may possibly also belong to this species.

2. **C. flexuosa**, *R. Br. Prod.* 239.—Stems 1 to 2 ft. high or even more; branches numerous, solitary within the lower sheaths, clustered in the upper ones and often several times divided, the ultimate clustered branches filiform, 1 to 2 in. long or even longer, all very flexuose or incurved. Sheathing scales brown, with short erect points. Spikelets single, on pedicels mixed with the clustered branches and resembling them, very narrow linear, 3 to 4 lines long, all apparently equally fertile. Glumes narrow, acute, the lower empty ones shorter and more aristate. Persistent style-base brown, often as long as the nut and slightly contracted at the base, more or less pubescent at the time of flowering, usually glabrous on the ripe nut.—*Kunth, Enum. ii. 306*, partly; *Guillem. Ic. Pl. Austral. t. 14*; *F. Muell. Fragm. ix. 19*; *Restio crispatus*, *Nees in Sieb. Agrostoth. n. 37*.

N. Australia. Port Essington, *Armstrong*.

Queensland. Moreton Bay and Island, *F. Muell.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Wools* and others; *Cowan's Creek, Fitzgerald*; *Castle Creek, Leichhardt*; *New England, C. Stuart*; southward to *Illawarra, A. Cunningham*.

Victoria. East Gipps' Land, *Walker*.

3. **C. recurvata**, *Spreng. Syst. Cur. Post.* 26.—Stems knotted and almost bulbous at the base, unisexual but the males and females often proceeding from the same rhizome, the males 1 to 2 ft. high, paniculately branched, the flowering branches sometimes all erect or slightly flexuose, sometimes intermixed with clusters of short flexuose or curved sterile branchlets, and occasionally a few female spikelets; the female stems usually distinct, with very numerous intricate flexuose branchlets. Male spikelets solitary or few together in a short spike sessile or on short angular or flattened peduncles within glume-like but sheathing broad striate bracts, the spikelets themselves sessile or shortly pedicellate, 5 to 6 lines long. Glumes 1 empty and 2 flowering or 2 empty and 1 flowering, the outer ones tapering into a fine point or awn, the inner one acutely acuminate. Female spikelets much shorter, solitary on short flexuose or involute pedicels. Stamens usually 5 or 6, rarely fewer, without anthers in the females. Style-branches 3, the style usually rudimentary in the males. Nut ovoid-oblong, tapering into the narrow conical persistent base of the style.—*F. Muell. Fragm. ix. 19*; *Restio uncinatus*, *Nees in Sieb. Agrostoth. n. 35*.

N. S. Wales. Port Jackson, *C. Moore, Fitzgerald*; *Richmond River, Mrs. Hodgkinson*.

Melachne Sieberi, *Schrad.* was originally referred by *Nees in Linnæa, ix. 301*, to this *C. recurvata*, a mistake which he corrected in *Ann. Nat. Hist. ser. 1. vi. 50*, transferring it to the *Gahnia Sieberi*.

4. **C. restiacea**, *F. Muell. Herb.*—Stems nearly 2 ft. high, knotted at the base and unisexual as in *C. recurvata*, of which this may possibly be a variety, but much more slender, and the female specimens sometimes not more flexuose than the males, the peduncles and ultimate branches as slender as in *C. flexuosa*. Male spikelets larger than in

C. flexuosa, smaller than in *C. recurvata*. Stamens in the males and filaments in the females 4 in all the specimens examined. Nut ovoid, the beak or thickened base of the style much smaller than the nut itself.

N. S. Wales. Berrima, *Miss Calvert*, where it is much used for carpet brooms.
Victoria. Grampians, *F. Mueller*.

5. *C. dioica*, *R. Br. Prod.* 239.—Stems rigid, knotted and almost bulbous at the base, 6 in. to $1\frac{1}{2}$ ft. high, unisexual, the males with short erect flowering branches and few short subulate barren ones, the female and barren stems with numerous clusters of flexuose or recurved but rigid and pungent barren branchlets. Sheathing scales rather loose, obliquely truncate and ciliate at the orifice, the upper and flowering ones with rigid spreading points of a few lines, those at the base of the stem looser, more open, and sometimes tapering into laminae of 2 or 3 in. Male spikelets sessile or shortly pedunculate, within tubular or cupshaped pubescent bracts with rigid spreading points, the spikelets 3 to 4 lines long. Glumes acuminate or shortly aristate, slightly pubescent, the outer ones rather rigid. Stamens 5 or 6. Female spikelets smaller, all on recurved rigid flattened or angular pedicels mixed in with the clustered branchlets, the glumes more membranous than in the males. Barren filaments 5 or 6. Nut large, ovoid, tapering into the conical base of the style.—*F. Muell. Fragm.* ix. 19; *C. hexandra*, *Nees in Pl. Preiss.* ii. 88.

W. Australia. Lucky Bay, *R. Brown*; King George's Sound and neighbourhood, *Drummond*, n. 94, *Preiss*, n. 1697, *F. Mueller*; Swan River, *Preiss*, n. 1698; Murdoch, *ver.* *Oldfield*.

Some male specimens from Drummond's first Swan River collection are remarkable for all the leaf-sheaths being produced into linear-subulate erect or spreading laminae of 2 to 5 in.

27. ARTHROSTYLES, *R. Br.*

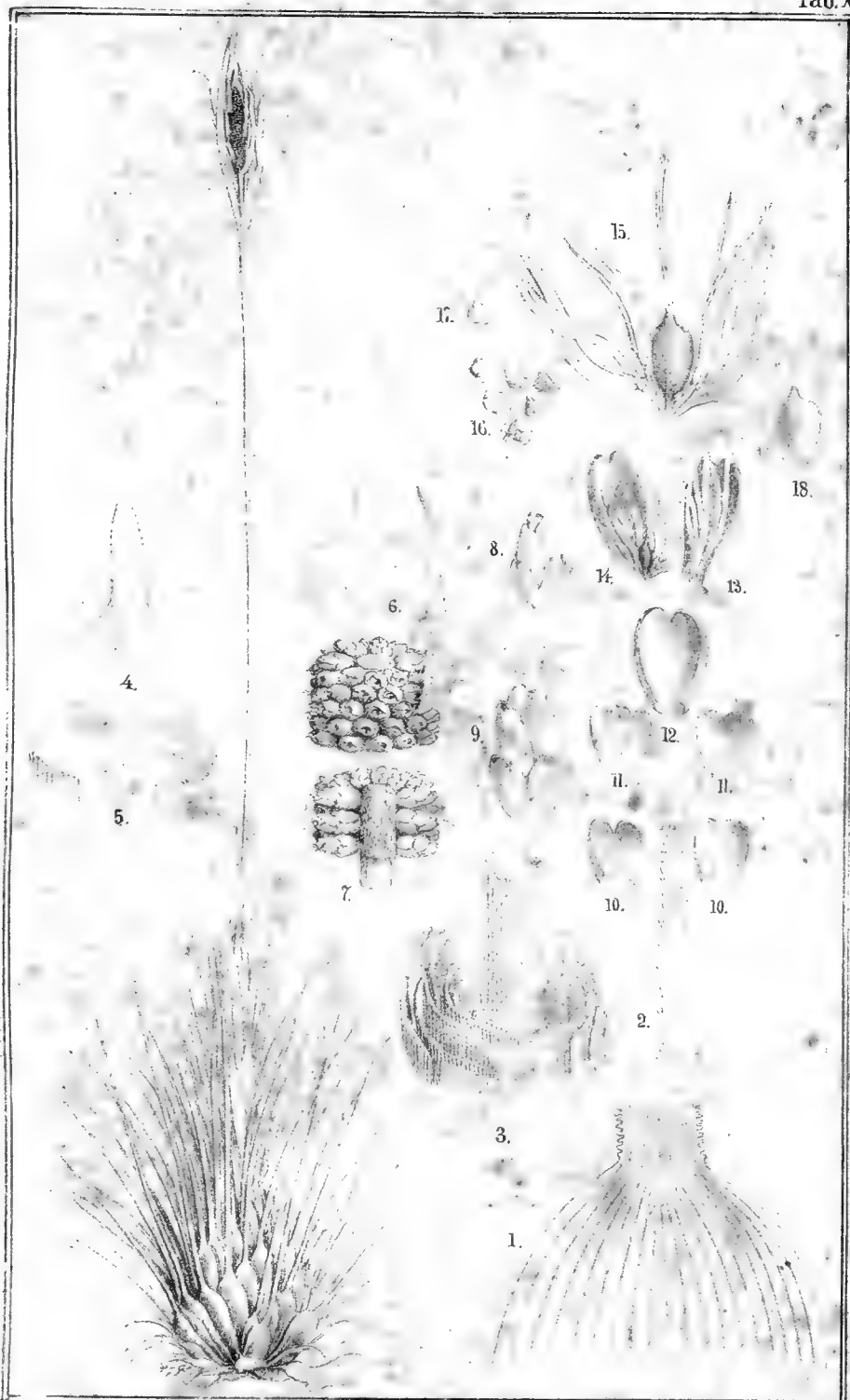
Spikelets with a single hermaphrodite flower or rarely with a second male flower. Glumes several, all but the uppermost 1 or 2 empty imbricate all round the rhachis. Hypogynous bristles none. Stamens or staminodia 6, filaments 3 short with perfect anthers, 3 much longer with very deciduous (or without?) anthers. Style hairy, thickened at the base, articulate and falling off below the thickening; stigmatic branches 3, recurved, densely cottony-woolly. Nut obovoid-globular, obscurely 3-angled, very obtuse.—Perennial, leafless except the sheathing scales at the base. Spikelets in a small terminal head.

The genus as above characterised is limited to the single Australian species, for the three from the Mascarene Islands, from Ceylon, and from China which have been associated with it have neither the six filaments nor the peculiar style of *Arthrostyles*, and the shape of the spikelets gives them a very different aspect. Whether they should form a distinct genus, or be associated with *Fimbristylis* from which they differ nearly as *Kyllinga* does from *Cyperus*, or whether the generic character of *Arthrostyles* should be extended so as to include them, are questions which remain to be









F. Schenck del. & lit.

F. Mueller direxit.

Hamel & C. imp.

Reedia spathacea. FM.



determined by those who will work up the Indian flora. In the Chinese species I have not succeeded in finding the hypogynous bristles observed by Hance. The three filaments, short at first, become very long by the time the flowering is over and loose their anthers, but can scarcely have been mistaken for bristles.

1. **A. aphylla**, *R. Br. Prod.* 229, *not of Bœckel*.—Stems from a short thick rhizome erect, more or less tufted, rigid, more or less flattened, from very slender to about 1 line broad, 1 to 1½ ft. high, the sheathing scales at the base more or less hairy, thin and scarious at the top, the old ones dark brown and persistent round the base of the flowering stems after their own stems have perished. Terminal head of spikelets depressed-globular or hemispherical, 3 to 4 lines diameter. Outer bracts lanceolate-acuminate or almost subulate, 1 or 2 often nearly as long as the head, the others subtending the spikelets gradually passing into the glumes. Spikelets numerous and sessile in the head, 1½ to nearly 2 lines long. Glumes about 7, the innermost flowering one oblong-lanceolate, acute, membranous, obscurely 3- or 5-nerved, the others gradually shorter and broader, all empty in the spikelets examined, but according to Bœckeler there is sometimes a second male flower. Anthers of the longer stamens when present exerted, those of the shorter ones included. Style-branches recurved and very conspicuous from their white pubescence. Nut whitish, smooth or under a strong lens minutely reticulate. — *Fimbristylis aphylla*, *F. Muell. Fragm.* ix. 9, as to the Australian plant; *F. planiculmis*, Bœckel. in *Linnæa*, xxxviii. 391.

N. Australia. Croker's Island, *A. Cunningham*; near Providence Hill, *F. Mueller*; Port Essington, *Armstrong*, *Leichhardt*; Port Darwin, *Schultz*, n. 655.

Queensland. Endeavour River, *Banks and Solander*.

I have always found the six filaments in *Schultz's* specimens as in *Cunningham's*, *F. Mueller's*, and *Armstrong's*. *R. Brown* in his character does not mention the number of stamens. In most cases, by the time the style-branches are well out, the longer filaments are without anthers, but in the bud I have generally seen one at least, and once all three present.

28. REEDIA, *F. Muell.*

Spikelets numerous, in a long cylindrical spike enclosed in the sheaths of long leafy bracts, with 1 hermaphrodite and 1 or 2 male flowers below it. Glumes imbricate all round the rhachis, all empty except the 2 or 3 upper ones. No hypogynous scales or bristles. Stamens 6 (rarely 5?). Style terete, with 3 short stigmatic branches. Nut . . . —Stems very tall, from within a dense tuft of long leaves, otherwise leafless. Spikelets small.

The single species is endemic in Australia.

1. **R. spathacea**, *F. Muell. Fragm.* i. 240, *t.* 10.—Stems from a thick woody base terete, slender but rigid, nearly 6 ft. high. Leaves very numerous and densely crowded at the base of the stem, often 2 ft. long or more, spreading, the outer ones 4 to 5 lines broad, abruptly dilated into brown imbricate bases 3 to 4 in. long and 1½ to 2 in.

broad, the inner ones narrower, dilated at the base into open sheaths, all with scabrous margins. Spike terminal, 3 to 4 in. long, $\frac{3}{4}$ in. diameter, quite enveloped in the long loose sheathing bases of 2 or 3 long leafy bracts, the inner one affixed close under the spike the others lower down. Spikelets ovate-oblong, slightly flattened, very obtuse, of a rich brown, about 3 lines long and nearly 2 lines broad, all very regular and distinct though close together. Glumes closely imbricate, broad, very obtuse, sometimes split into 2 or 3 short lobes, finely striate but not keeled or nerved, about 8 or 9 empty, the lowest very short the others gradually longer, the flowering ones the longest and thinner, the innermost containing the hermaphrodite flower very thin. Anthers long on short filaments. Ovary with about 6 prominent longitudinal ribs. Nut not seen.

W. Australia. Marshy sea-coast, between King George's Sound and the mouth of the Gordon River, *A. Gregory*; near Cape D'Entrecasteaux, *Governor Weld*.

29. EVANDRA, R. Br.

Spikelets paniculate or few in a cluster, with 2 flowers both hermaphrodite or the lower one male only. Glumes imbricate all round the rachis, all but the 2 uppermost empty. No hypogynous scales or bristles. Stamens 12 to 20 or even more; anthers linear, with a rather long appendage. Style slender, deciduous, with 8 filiform stigmatic branches. Nut . . . —Stems tall, leafy throughout or at the base only. Spikelets rather large.

The genus is limited to Australia.

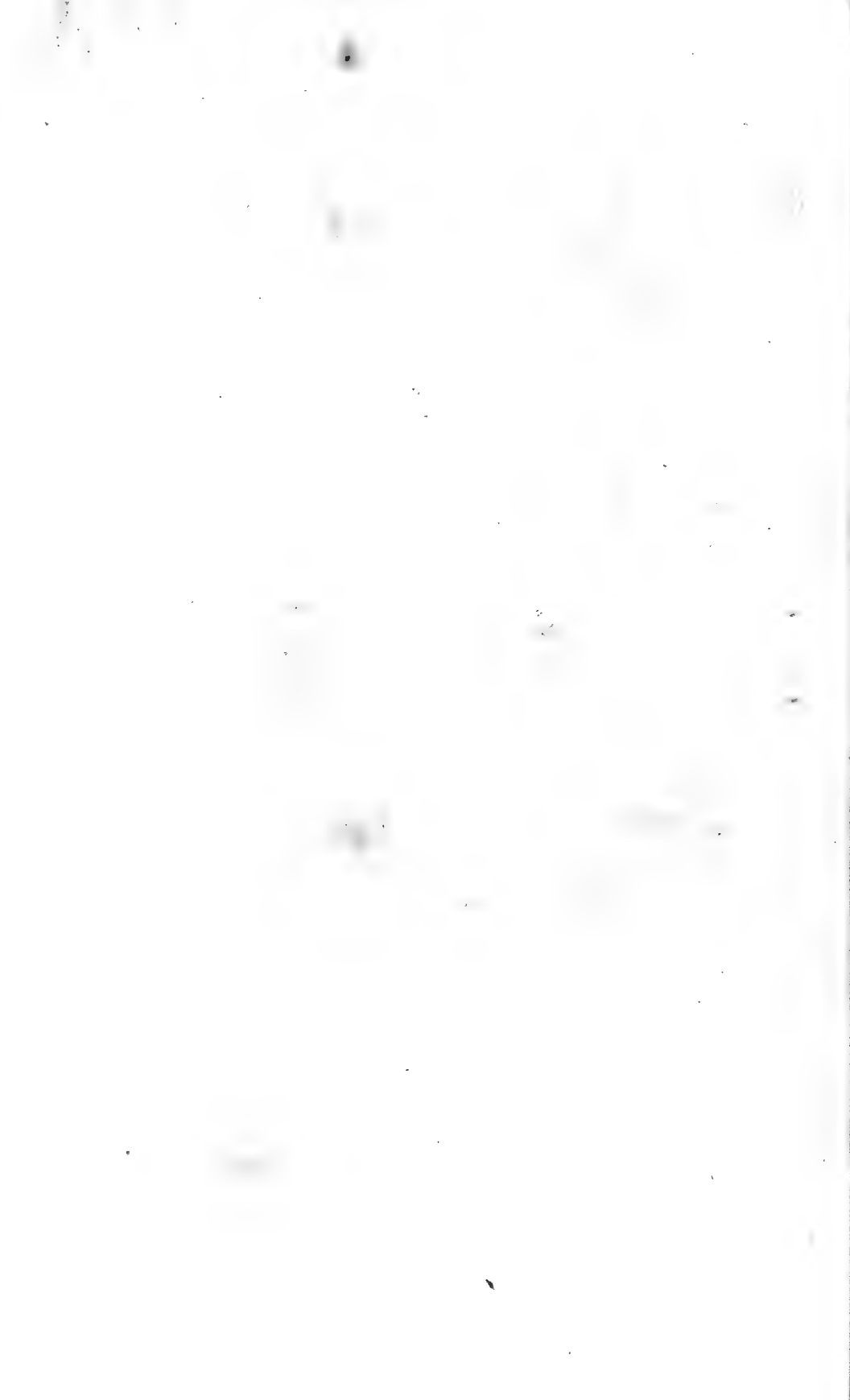
Stem leafy throughout. Spikelets numerous in a long loose unilateral panicle. Glumes aristate

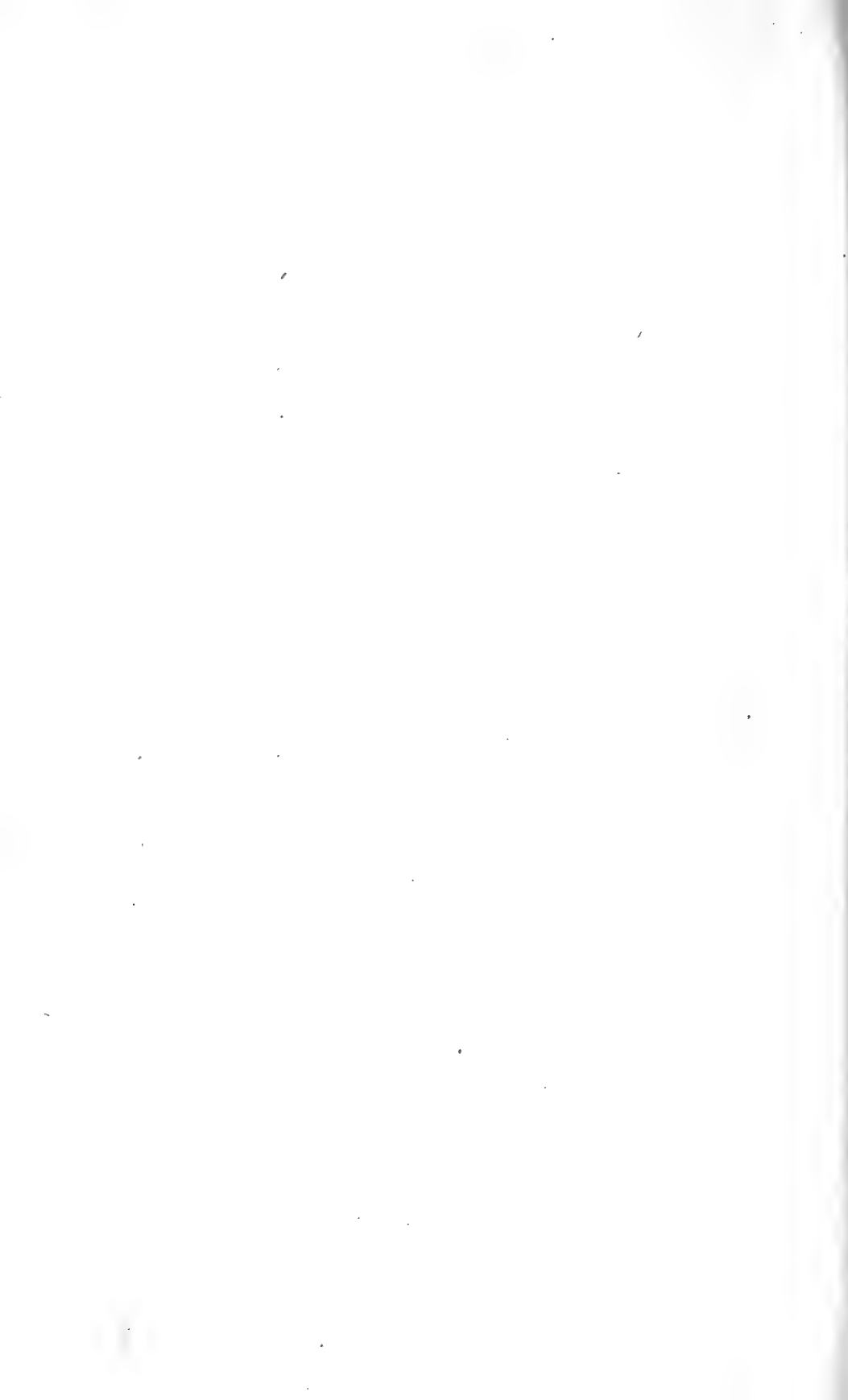
1. *E. aristata*.

Stem leafy at the base only. Spikelets 2 or 3 in a terminal cluster. Glumes acute

2. *E. pauciflora*.

1. ***E. aristata*, R. Br. Prod. 239.**—Stems from a thick rhizome 2 to 3 ft. high, obtusely triquetrous. Leaves distant, long and narrow but flat, with scabrous margins, those on the stem with black closed sheaths of about 1 in., the radical ones with long open sheaths. Panicle long, unilateral and very loose; peduncles filiform, clustered in the upper axils, some short with 1 spikelet, others longer with several spikelets, all pedicellate within sheathing bracts ending in subulate points. Spikelets oblong, 6 to 9 lines long. Empty glumes 15 or more, the outer ones very short, the inner gradually longer, very rigid, dark-coloured, with long subulate points or awns, the innermost with scarious margins; flowering glumes 2 in the flowers examined, the lower one like the inner empty ones but with broader scarious margins, the other one smaller, very thin and hyaline without any subulate point. Stamens 16 to 20 or even more, the short filaments connate at the base with the thin base of the ovary. Ovary pubescent in the free part, perfect in the upper flower, often abortive in the lower one.—*Nees* in *Pl. Preiss.* ii. 89; *Bœckel.* in *Linnaea*, xxviii. 310; *F. Muell. Fragm.* ix. 18; *Hook. Ic. Pl. t.* 1212.









W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Drummond*, n. 397; *Preiss*, n. 1779, *Oldfield*, *F. Mueller* and many others.

2. ***E. pauciflora*, R. Br. Prod. 239.**—Stems 2 to 3 ft. high, very slender, leafless except at the base. Leaves very narrow and long, gradually expanded at the base into long open striate sheaths. Spikelets in our specimens 2 or 3, sessile in a terminal cluster with a subulate bract sheathing at the base either spreading with a second shorter bract, or erect and continuing the stem making the cluster then appear lateral. Spikelet about 6 lines long. Glumes numerous as in *E. aristata*, but acute not aristate, the empty ones glabrous or the upper ones pubescent at the end; flowering glumes 2 or 3, thin, silky pubescent, each with 12 or more stamens, but one only with a pistil; appendage of the anthers not so long as in *E. aristata*.—Hook. Ic. Pl. t. 1213.

W. Australia. King George's Sound, *R. Brown*; also *Drummond*, n. 362.

TRIBE IV. SCLERIEÆ.—Flowers strictly unisexual in unisexual or androgynous spikelets. No utricle enclosing the females. Ovary and nut seated on a disk.

30. SCLERIA, Berg.

(*Diplacrum*, *R. Br.* *Sphæropus*, *Bæckel.*)

Flowers unisexual in unisexual or androgynous spikelets, the female flowers always solitary in the spikelet, the males usually several, placed above the female one in the androgynous spikelets. Glumes imbricate all round, 1 to 3 outer ones empty. No hypogynous bristles or scales. Stamens 1 to 3. Style slender, deciduous, with 3 filiform stigmatic branches. Nut globular or ovoid, usually white, raised on a thickened entire or more or less 3-lobed single or double disk.—Perennials or rarely annuals. Stems triquetrous, leafy, the leaf-sheaths often but not always terminating in a prominent ligula opposite the lamina. Spikelets in clusters or small corymbose or oblong panicles, terminal and axillary, or in a large compound terminal panicle.

The genus is generally spread over the tropical and subtropical regions of the New and the Old World, extending also into the temperate regions of North America. Of the thirteen Australian species five are widely spread over tropical Asia, two or three of them also in Africa, two are at least in the Malayan Archipelago or in the Pacific Islands, the remaining six appear to be endemic. No species has been found in New Zealand. The habit of the genus is very variable, but not more so than that of *Schænus*, and although it has been divided by Nees and others into about a dozen genera, chiefly founded on the form of the disk, I have been unable to discover any distinct sectional characters beyond those which separate single species, and the following series are founded chiefly on inflorescence.

SERIES I. Axillares.—*Small annuals. Spikelets small, strictly unisexual, in little axillary or terminal sessile clusters, the males with 1 to 3 flowers.*

Two upper glumes of the female spikelets enclosing the

nut and 3-toothed 1. *S. caricina*.

Two upper glumes of the female spikelets enclosing the nut and entire. 2. *S. pygmæa*.

SERIES II. **Laxæ.** *Weak plants under 1 ft., probably annual. Spikelets strictly unisexual, in axillary clusters or few in loose spikes, the males with several flowers.*

Spikelets in axillary clusters or small cymes. Outer persistent disk broadly cupular, inner adnate, very shortly 3-lobed 3. *S. rugosa*.

Spikelets few, small, in loose spikes. Outer disk scarcely prominent, inner adnate, shortly 3-lobed 4. *S. laxa*.

SERIES III. **Subspicatæ.**—*Perennials. Inflorescence scarcely branched. Fertile spikelets more or less androgynous or at least with empty glumes above the female flower.*

Nut tuberculate. Disk-lobes broad, membranous, spreading 5. *S. Brownii*.

Nut smooth and shining. Outer persistent disk cupular, entire; inner obsolete 6. *S. lithosperma*.

Nut tuberculate or reticulate. Disk-lobes adnate, very short broad and thick 7. *S. tessellata*.

SERIES IV. **Polystachyæ.**—*Perennials. Panicles branched, axillary and terminal. Spikelets unisexual or the fertile ones androgynous.*

Leaf-sheaths with acute angles scarcely or not at all winged.

Panicles scarcely branched. Nut tuberculate or reticulate. Disk-lobes very short and broad 7. *S. tessellata*.

Panicles dense, with numerous spikelets.

Nut smooth and shining. Disk-lobes broad, obtuse, entire 8. *S. margaritifera*.

Nut rugose or nearly smooth. Disk-lobes broad, denticulate at the end 9. *S. Græffiana*.

Leaf-sheaths distinctly winged on the angles.

Panicles loose, not much branched. Disk-lobes acute 10. *S. hebecarpa*.

Panicle dense with numerous long subulate bracts.

Disk-lobes broad, usually very obtuse 11. *S. chinensis*.

SERIES V. **Macrostachyæ.**—*Panicle single, large, loose and very compound, on a long terminal peduncle.*

Disk-lobes obscure 12. *S. oryzoides*.

SERIES VI. **Dioicæ.**—*Spikelets strictly dioecious, small, densely clustered, in numerous short axillary and terminal panicles.*

Disk-lobes broad, membranous, spreading 13. *S. sphacelata*.

S. setoso-asperula, Boeckl. in Flora, 1875, 120, from Lake Elphinstone, *Amalia Dietrich*, is described as having the inflorescence and other characters of the *Subspicatæ*, with narrow leaves scabrous or setulose on the upper surface, small white nuts transversely undulate or plicate, and the disk obsolete. I do not identify it with any specimen I have seen.

SERIES I. **AXILLARÆ.**—*Small annuals. Spikelets small, strictly unisexual, in little axillary or terminal sessile clusters, the males with 1 to 3 flowers. Stamens 1 or 2.*

1. **S. caricina**, *Benth.*—*A diffuse branching annual, attaining 6 to 9 in. but often smaller. Leaves linear or linear-lanceolate, obtuse*

or acute, $\frac{1}{2}$ to 2 in. long, the sheaths striate and keeled. Spikelets unisexual, under 1 line long, in little dense axillary clusters sessile or very shortly pedunculate, each spikelet in the axil of a thin glume-like bract. Male spikelet: Glumes about 3, very thin and narrow; flowers usually 2, each with 1 or 2 stamens. Female spikelet: Glumes usually 3, the 2 inner ones ovate-lanceolate, acute, with an acute tooth on each side shorter than the central point; flower 1 only, without any empty glumes above it. Nut closely enveloped in the 2 enlarged several-nerved glumes, globular, reticulate and pitted, slightly hispid. Disk adnate, small, with a scarcely prominent 3-angled or 3-lobed margin.—*Diplacrum caricinum*, R. Br. Prod. 241; Kunth, Enum. ii. 360; Endl. Iconogr. t. 25; Bœckel. in Linnæa, xxxviii. 434; *D. tridentatum*, Brongn. in Duperr. Voy. Bot. t. 26.

Queensland. Endeavour River, Banks and Solander.

Common in tropical Asia from Ceylon to Hongkong and the Malayan Archipelago. The close connection of this plant with *Scleria* was suggested by Brown, but it was generically separated on account of the supposed homology of the 2 glumes enclosing the fruit with the perigynium or utricle of *Carex*, which however has been since shown to be a mistake. The habit of the plant is indeed very different from that of the larger species of *Scleria*, being that of *Schœnus axillaris*, but the difference is not greater than in *Schœnus*, and, as in that genus, there is too close a series of intermediate species to justify a generic separation.

2. **S. pygmæa**, R. Br. Prod. 240.—A dwarf branching annual, rarely exceeding 2 in. Leaves linear-lanceolate, acute, $\frac{1}{2}$ to 1 in. long. Spikelets unisexual, 1 to $1\frac{1}{2}$ lines long, very numerous in little axillary and terminal sessile clusters, the inner bracts subulate-acuminate. Male spikelets: Glumes 2 or 3, very narrow and hyaline, usually enclosed in the longer subtending bract; flowers 1 or 2 each with 1 or 2 stamens. Female spikelet: Glumes usually 3, the inner ones lanceolate, acutely acuminate, finely several-nerved, quite entire but dilated below the middle, with membranous margins enclosing the fruit; no empty glumes above the flower. Nut globular, about $\frac{1}{4}$ line diameter, prominently 3-ribbed, tuberculate-rugose between the ribs. Disk small, adnate, with 3 slightly prominent semi-circular lobes.—F. Muell. ix. 22; *Hypoporum pygmæum*, Nees in Linnæa, ix. 303; *Sphæropus pygmæus*, Bœckel. in Linnæa, xxxviii. 436.

N. Australia. Port Darwin, Schultz, n. 260.

Queensland. Endeavour River, Banks and Solander; Rockingham Bay, Dallachy.

Bœckeler, in the Linnæa, xxxviii. 434, describes under the name of *Diplacrum pygmæum* an African plant which he believes to be the same as Brown's *Scleria pygmæa*, but which has more the elongated habit of *S. caricina*, and differs essentially from both in the minute nuts with several longitudinal raised nerves or ribs between the primary ones, otherwise quite smooth, and the disk very minute or quite obsolete. He failed to recognise Brown's *S. pygmæa* in Schultz's specimens, probably from having overlooked the male spikelets which in an advanced stage of inflorescence are so much withered away as to be very difficult to find. I have seen them however in Schultz's as well as in other specimens.

SERIES II. LAXÆ. — Weak plants, under 1 ft. and probably annual. Spikelets strictly unisexual, in axillary clusters or few in loose spikes, the males with several flowers, the females without empty glumes above the flower. Stamens usually 2.

3. *S. rugosa*, *R. Br. Prod.* 240. — Weak and branching, apparently annual, 6 in. to 1 ft. high. Leaves grass-like, the lower ones sometimes longer than the stem. Clusters of spikelets axillary and terminal, sometimes almost sessile, solitary but compound, and often with 1 or 2 pedunculate clusters or flowering branches with the sessile one in the lower axils, the foliage and inflorescence either sprinkled with short hairs or quite glabrous. Male spikelets stipitate in the clusters, about 1 line long, with several flowers. Outer empty glumes usually 3, acuminate, with ciliate keels; flowering glumes very narrow and hyaline, not exceeding the outer empty ones. Stamens 1 or 2 in each flower. Female spikelets nearly sessile. Glumes usually 3, acuminate, with ciliate hirsute keels, about $1\frac{1}{2}$ lines long. No empty glumes above the flower. Nut globular, pitted and rugose. Disk double, the external persistent one broadly cupulate and entire, the inner adnate one with an undulate or obtusely 3-lobed margin. — F. Muell. *Fragm.* ix. 22.

N. Australia. Port Darwin, *Schultz*, n. 80; Upper Victoria River, *F. Mueller*.

Queensland. Endeavour River, *Banks and Solander*, Rockingham Bay, *Dallachy*.

. This species closely connects the preceding with the following ones.

4. *S. laxa*, *R. Br. Prod.* 240. — Stems weak and slender, 6 in. to 1 ft. high. Leaves long and narrow, chiefly at the base of the stem, the floral ones similar but shorter. Spikelets unisexual, not numerous, in a terminal almost simple loose and interrupted spike, and a few similar spikes on long filiform peduncles in the axils of distant leafy bracts. Male and female spikelets equally sessile or nearly so, in little clusters usually of 2 males and 1 female, all under 2 lines long. Male flowers several, the glumes very narrow. Stamens usually 2. Glumes in the female spikelet 3 or 4, broader than in the males, membranous, acuminate, no empty ones above the flower. Nut ovoid-globular, white, reticulate. Disk adnate, with 3 short undulate lobes, at first sometimes rather acute, but thickened and obtuse with recurved sinuses under the ripe nut, the outer disk not prominent. — F. Muell. *Fragm.* ix. 21; *S. Novæ-Hollandiæ*, Boeckl. in *Flora*, 1875, 120 (from the char. given).

N. Australia. North Coast, *R. Brown*.

Queensland. Rockingham Bay, *Dallachy*; Brisbane River, *Bailey*; Port Mackay, *Amalia Dietrich* (if correctly identified.)

SERIES III. SUBSPICATÆ. — Perennials. Inflorescence scarcely

branched. Fertile spikelets more or less androgynous, or at least with empty glumes above the female flower. Stamens 1 to 3.

5. **S. Brownii**, *Kunth, Enum.* ii. 349.—Stems slender, 1 to 2 ft. high. Leaves long and narrow, rather rigid, very scabrous or nearly smooth, the sheaths often pubescent and slightly fringed at the orifice, the floral leaves or bracts similar, the upper ones shorter, but all leaf-like and distant. Spikelets androgynous or male, 2 to near 3 lines long, several together in axillary and terminal sessile or pedunculate clusters. Outer empty glumes 2 or 3, lanceolate, acuminate, the one under the female flower much dilated, very narrow under the males. Male flowers very few above the female in the androgynous spikelets, each with 1 or 2 stamens, more numerous with 3 stamens each in the male spikelets. Nut ovoid or globular, 3-ribbed, more or less tuberculate or granular, tipped with the short base of the style. Disk with 3 broad spreading membranous obtuse or truncate lobes, and often shortly aristate within or below the lobes or both.—Bœckel. in *Linnaea*, xxxviii. 453; F. Muell. *Fragm.* ix. 21; *S. distans*, R. Br. *Prod.* 240, not of Poir.

N. Australia. Arnheim South Bay, *R. Brown*; Port Darwin, *Schultz*, n. 37, 782.

Queensland. Rockhampton, *O'Shanessy* and others; Nerkool and Herbert's Creeks, *Bowman*; Oxley's Station, *Leichhardt*; Dawson and Burnet Rivers, *F. Mueller*.

S. pallidiflora, Bœckel. in *Flora*, 1875, 119, from Gladstone, *Amalia Dietrich*, is probably referrible to *S. Brownii*.

6. **S. lithosperma**, *Willd.*; *Kunth, Enum.* ii. 349.—Stems slender, 1 to 1½ ft. high. Leaves very narrow linear and rather long, sometimes almost filiform, the sheaths acutely 3-angled, usually pubescent on the sides and slightly fringed at the orifice, the upper ones passing into distant leafy bracts gradually shorter and more subulate. Peduncles axillary and terminal, the lowest often much elongated, the upper ones very short, each bearing 1 to 4 clusters of 2 or 3 spikelets or the upper spikelet sessile and solitary within the bract. Spikelets 1½ to 2 lines long, more or less androgynous or male. Outer glumes spreading, acuminate, 2 empty, the 3rd broader with a female flower, and above it several sometimes numerous narrower glumes with 1 or 2 stamens in each; in the male spikelets the glumes and flowers more numerous and the stamens often 3. Nut ovoid, smooth and shining or rarely slightly tuberculate. Outer persistent disk broadly cupular, entire, inner adnate one reduced to a brown ring or quite obsolete.—Bœckel. in *Linnaea*, xxxviii. 451; F. Muell. *Fragm.* ix. 21; *S. capillaris*, R. Br. *Prod.* 240; *Kunth, Enum.* ii. 349; *Hypoporum capillare*, Nees in *Linnaea*, ix. 303; *H. Sieberi*, Nees in *Sieb. Agrostoth.* n. 97.

N. Australia. Arnheim S. Bay, *R. Brown*; Port Darwin, *Schultz*, n. 6, 171 266, 817.

Var. *linearis*. Leaves rather broader, inflorescence more branched with more numerous spikelets, but the structure and disk the same.

Queensland. Brisbane River, *F. Mueller*.

The species is widely spread over tropical Asia, the var. *linearis* corresponds nearly to Thwaites' var. β . from Ceylon or Boeckeler's var. n. 1.

SERIES III. POLYSTACHYÆ.—Perennials. Panicles branched, axillary and terminal, sometimes nearly simple in *S. tessellata*. Spikelets strictly unisexual, or the fertile ones androgynous. Stamens usually 3.

7. *S. tessellata*, Willd.; Kunth, Enum. ii. 343.—Stems 1 to $2\frac{1}{2}$ ft. high, rather slender. Leaves mostly 2 to 3 lines broad, the sheaths acutely 3-angled and sometimes narrowly winged, quite glabrous, produced into a short rounded glabrous or shortly ciliate membrane or ligula. Panicles axillary or terminal, the terminal one narrow, 1 to 2 in. long with few erect branches, the axillary ones few, small, distant, pedunculate, the subtending bracts leaflike. Spikelets not numerous, unisexual. Males narrow, fully 2 lines long, with numerous flowers. Glumes narrow, obtuse, closely enveloping each other, 2 or 3 outer ones empty or rather shorter. Stamens 3. Flowering glume of the female spikelets broad, almost acute, 2 or 3 outer empty ones shorter, and 1 or 2 small narrow empty ones above the flower. Nut white, tuberculate or reticulate and sometimes slightly pubescent. Disk adnate, with very short broad obtuse lobes, the outer persistent one only slightly prominent, or rarely broader and somewhat cupular.—Boeckel. in Linnæa, xxxviii. 470.

Queensland. Brisbane River, *F. Mueller*.

Var. *debilis*. Stems weak and slender. Leaves narrow. Panicles small, on long peduncles.—Rockingham Bay, *Dallachy*.

The species is widely spread over tropical Asia. It seems to vary in the breadth of the foliage as well as in the degree of development of the disk, which I do not find quite the same in different spikelets of the same specimen. It should probably include *S. uliginosa*, Hochst. and *S. Steudeliana*, Miq., and perhaps some others distinguished by Boeckeler.

S. mackariensis, Boeckel. in Linnæa, 1875, 119, from Port Mackay, *Amalia Dietrich*, must be very near to if not identical with *S. tessellata*.

8. *S. margaritifera*, Willd.; Kunth, Enum. ii. 341.—Stems stout, 2 to 3 ft. high, the angles and margins of the leaves scabrous, otherwise glabrous. Leaves long, 3 to 5 lines broad, the sheaths acutely 3-angled but not winged; in the upper part of the stem 2 or 3 leaves often close together, the others distant, the floral ones or leafy bracts gradually smaller. Panicles axillary and terminal, loosely pyramidal, 2 to 3 in. long, forming a narrow leafy interrupted panicle of 1 ft. or more. Inner bracts small. Spikelets scarcely $1\frac{1}{2}$ lines long, unisexual, singly sessile along the branches, the females usually nearer the base, the males many-flowered. Stamens 2 or 3. Nut nearly globular, white, smooth

and shining or slightly reticulate. Disk adnate with 3 broad obtuse lobes, the outer one not prominent.—R. Br. Prod. 240; Bœckel. in Linnæa, xxxviii. 511; F. Muell. Fragm. ix. 21.

Queensland. Endeavour River and Bay of Inlets, *Banks and Solander*; Rockhampton, *Thozet*; Fitzroy Island, *Walter*. The species is also in the Pacific islands and perhaps in the Malayan Archipelago.

9. **S. Græffeana**, Bœckel. in *Flora*, 1875, 121 (from the char. given).—Stature and habit of *S. margaritifera*, the leaves similarly collected 2 or 3 together in the upper part of the stem and the sheaths not winged, but the leaves longer and narrower and as well as the angles of the stem quite smooth or scarcely scabrous. Panicles ovate-pyramidal, dense or rather loose, the terminal one 2 or 3 in. long, and 2 or 3 distant axillary ones smaller. Outer bracts leaflike; inner ones not exceeding the spikelets or here and there a subulate one rather longer. Spikelets numerous, unisexual, the males about 2 lines long. Stamens usually 2. Nut globular, white, tubercular-rugose or nearly smooth, glabrous or sparingly pubescent. Outer persistent disk at length almost cupular, inner adnate disk with 3 broad lobes denticulate at the end.

N. Australia. Near Providence Hill, *F. Mueller*.

Queensland. Cape York, *M'Gillivray*; Cape Grafton, *A. Cunningham*; Port Mackay, *Analia Dietrich* (if correctly identified).

10. **S. hebecarpa**, *Nees*; *Kunth, Enum.* ii. 357.—Stems 1 to 3 ft. high, glabrous as well as the foliage. Leaves 2 to 3 lines broad, the sheaths more or less winged on the angles. Terminal panicle $1\frac{1}{2}$ to 3 in. long, not much branched, with 1 or sometimes 2 leafy bracts and a second smaller panicle on a long peduncle in the axil of a leaf much lower down. Inner bracts small and subulate. Spikelets usually 3 together in little cymes or clusters, 2 male and 1 female, the males narrow, under 2 lines long, with numerous flowers. Stamens 3. Flowering glume of the females very broad, about 1 line long, with 2 or 3 outer empty ones. Nut globular or ovoid, white, smooth and shining but pubescent, under 1 line long. Disk adnate, with 3 acute lobes.—Bœckel. in Linnæa, xxxviii. 478; F. Muell. Fragm. ix. 21; *S. Dietrichiæ*, Bœckel. in *Flora*, 1875, 121, (from the char. given).

N. Australia. Port Darwin, *Schultz, n.* 816.

Queensland. Wide Bay, *Bidwill*; Rockingham Bay, *Dallachy*.

N. S. Wales. Richmond River, *Danger*.

Widely spread over tropical Asia. Some specimens of *Dallachy's* closely resemble this species, but the disk-lobes appear to be obtuse, they are however scarcely sufficient to characterise as a distant species.

11. **S. chinensis**, *Kunth, Enum.* ii. 357.—Stems 2 to 3 ft. high, glabrous as well as the foliage. Leaves 2 to 5 lines broad, the sheaths more or less winged on the angles, the ligula membranous, often 3 to 5 lines long, but on other leaves short. Terminal panicle dense, much

branched, 2 to 4 in. long, and 1 or 2 smaller axillary ones lower down. Outer bracts or floral leaves long and leaflike and numerous subulate-acuminate bracts within the panicle protruding far beyond the spikelets. Spikelets numerous and crowded, unisexual, usually 1 female and 1 or 2 males in each cluster, the males narrow about 2 lines long, the females with much broader glumes. Nut globular, white, irregularly tuberculate-rugose and sometimes sparingly pubescent. Disk adnate, with 3 broad lobes from very obtuse to almost acute; outer disk scarcely prominent.—Bœckel. in *Linnaea*, xxxviii. 486; F. Muell. *Fragm.* ix. 20.

Queensland. Rockingham Bay, *Dallachy*; Dunk and Goold Islands, *M. Gillivray*; Lower Herbert River, *Herb. F. Mueller*.

Also in the Malayan Archipelago and South China. It is very closely allied to *S. scrobiculata*, Nees, and to *S. malaccensis*, Bœckel. in which however the leaf-sheaths are not winged.

SERIES V. MACROSTACHYÆ.—Panicle single, large, loose and very compound, on a long terminal peduncle.

12. ***S. oryzoides*, Presl; Kunth, Enum. ii. 356.**—Stems from a creeping rhizome, tall, stout, glabrous as well as the foliage. Leaves erect, the lower ones long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, longitudinally plicate. Panicle terminal, pedunculate above the last leaf, ovate, 6 to 8 in. long, very compound, with numerous erect or slightly spreading slender branches. Outer bract short and subulate, the others very small. Spikelets singly sessile along the branches, about 2 lines long, all apparently unisexual in the Australian specimens, but often androgynous in Indian ones, the subtending bracts small, lanceolate, glume-like, keeled, with short points. Glumes of the female spikelets ovate-lanceolate, acute or almost obtuse, 3 or 4 outer empty ones gradually shorter and a small empty one above the flower. Glumes of the males narrower, numerous and closely imbricate. Stamens 3. Nut (in the Indian specimens) globular, white, smooth and shining. Disk adnate, thick but scarcely prominent, obscurely 3-lobed.—Bœckel. in *Linnaea*, xxxviii. 492.

N. Australia. Between M'Adam Range and Providence Hill, *F. Mueller*; Also in tropical Asia, and the same or a closely allied species in tropical Africa. The Australian specimens are in flower only but agree very well with Indian ones.

SERIES VI. DIOICÆ.—Spikelets strictly diœcious, small, densely clustered in numerous short axillary and terminal panicles.

13. ***S. sphacelata*, F. Muell. *Fragm.* ix. 20.**—Stems $1\frac{1}{2}$ to 3 ft. high, glabrous as well as the foliage. Leaves long and narrow, the recurved margins and keel scabrous, the sheaths acutely 3-angled but not winged, and no ligula. Panicles numerous, 1 to near 2 in. long, terminal and in the upper axils, the lower ones pedunculate and distant, the spikelets in the male plant very numerous and densely clustered on

the short branches of the partial panicles, rather less numerous but still clustered in the female. Outer bracts or floral leaves long and distant, the upper ones gradually shorter and more approximate. Spikelets scarcely 2 lines long. Glumes in the males numerous, obtuse or nearly so, 3 or 4 outer empty ones more acute or acuminate, with dark brown margins and keels or brown all over. Stamens 3. Female spikelets rather larger, with 3 or 4 acute or acuminate glumes, and no empty one above the flower. Nut globular, tuberculate, more or less pubescent. Disk with 3 very broad spreading membranous truncate lobes.

Queensland. Suttor River, *F. Mueller*; Rockingham Bay, *Dallaehy*; Rockhampton, *O'Shauesy*, *Thozet* and others; Springsure Cliffs, *Wuth*; Brisbane River, *Bailey*; Archer's Creek, *Leichhardt*.

Very different in aspect as well as in character from any other *Scleria* known to me. The male specimens in herb. *F. Mueller* are numerous, the females very few.

TRIBE V. CARICEÆ.—Flowers strictly unisexual, in unisexual or androgynous spikelets, the females enclosed in an utricle or perigynium.

31. UNCINIA, Pers.

Flowers unisexual, in a single terminal androgynous spikelet, male at the top. Glumes imbricate all round the rhachis. Stamens in the males 3 or rarely fewer, without hypogynous bristles or scales. Ovary in the females enclosed in a bottle-shaped utricle or perigynium contracted at the top, with a small oblique or 2-toothed orifice and at the base of the ovary within the utricle is a bristle (a barren pedicel) projecting beyond it and ending in a rigid hook. Style protruding, with 3 filiform stigmatic branches. Nut more or less 3-angled, enclosed in the somewhat enlarged persistent utricle.—Habit of *Carex* from which the genus differs only in the hooked bristle projecting from the utricle.

The genus extends to New Zealand and extra-tropical South America, and one species is in Mexico and the West Indies.

- | | |
|---|-------------------------|
| Leaves filiform. Spikelets loose, 3 to 9 lines long | 1. <i>U. tenella</i> . |
| Leaves linear. Spikelets dense, oblong, 9 to 12 lines long | 2. <i>U. compacta</i> . |
| Leaves and stems elongated. Spikelets narrow, $1\frac{1}{2}$ to 2 in. long. | |
| Leaves narrow-linear. Male flowers 3 or 4. Glumes all acute or obtuse | 3. <i>U. riparia</i> . |
| Leaves almost filiform. Male flowers rather numerous. | |
| Lowest glume produced into a filiform leaf | 4. <i>U. debilior</i> . |

1. ***U. tenella*, R. Br. Prod. 241.**—Stem and leaves filiform, in dense tufts, rarely above 6 in. high. Spikelet loose, narrow-oblong, 3 to 9 lines long, with about 6 to 12 female flowers and 3 or 4 males at the top. Male glumes small, narrow, very thin. Stamens 2 only in all the flowers examined. Female glumes lanceolate, acute, membranous, with a prominent keel, about $1\frac{1}{2}$ lines long. Utricle about as long as

the glume, the orifice with 2 small obtuse teeth. Hooked bristle nearly twice as long. Nut narrow, 3-angled, nearly as long as the utricule.—Hook. f. Fl. Tasm. ii. 102, t. 152 A; F. Muell. Fragm. viii. 151; *Carex tenella*, Poir. Dict. Suppl. iii. 282.

Victoria. Sealer's Cove, Dandenong Mountains, Mount Baw-Baw, source of the Yarra and Goulburn and Upper Tyers Rivers, *F. Mueller*.

Tasmania. Derwent River, *R. Brown*; moist woods, Hobarton and Black River, *Gunn*; Western mountains, *Archer*; Mount Wellington, *Gulliver*; Southport, *C. Stuart*. Some specimens from near Lake St. Clair, *F. Mueller*, are depauperated with only 3 or 4 female flowers.

The New Zealand *U. filiformis* is very closely allied to this species.

2. ***U. compacta*, R. Br. Prod. 241.**—Stems in open situations 2 or 3 in. high, rigid, with brown inflorescence, in shady moist localities 6 in. to near 1 ft. long, with a pale-coloured spikelet. Leaves as long or shorter, rarely much above 1 line broad. Spikelet oblong, dense or slightly interrupted at the base, $\frac{3}{4}$ to 1 in. long, the lowest 1 or 2 glumes or bracts sometimes produced into a leaflike point. Glumes otherwise broadly lanceolate, acute, membranous with a green keel, often 3-nerved, $2\frac{1}{2}$ to 3 lines long. Stamens 3. Utricle shorter than the glume, tapering at the base and at the top, 3-angled, the sides faintly striate or nerveless. Hooked bristle about twice as long as the utricule, but occasionally 1 or 2 of the lowest elongated and instead of the hook bear a male and a female flower with small glumes. Nut shorter than the utricule, 3-angled.—Hook. f. Fl. Tasm. ii. 103, t. 153 B; F. Muell. Fragm. viii. 152; *Carex compacta*, Poir. Dict. Suppl. iii. 282.

Victoria. Mount Baw-Baw, at an elevation of 3000 to 4000 ft., *F. Mueller*.

Tasmania. Derwent River, *R. Brown*; summit of Mount Wellington, *Gunn*, *F. Mueller*; Mount Perouse, *C. Stuart*; Western Mountains, *Archer*; Mount Field East, *F. Mueller*.

U. nervosa, Boott in Hook. f. Fl. Tasm. ii. 102, t. 153 A, is founded on a single specimen which appears to me to be a narrow-leaved state of *U. compacta*.

U. divaricata, Boott, from New Zealand, referred to *U. compacta* in Hook. f. Handb. N. Zeal. Fl. 309, differs slightly in the many-nerved glumes and rather longer utricles.

3. ***U. riparia*, R. Br. Prod. 241.**—Stems slender, 1 to $1\frac{1}{2}$ ft. high. Leaves as long or longer, linear, about 1 line broad. Spikelet narrow, $1\frac{1}{2}$ to 2 in. long, the male flowers 3 or 4 only at the top, the females rather distant in the lower part, closer together higher up. Glumes acute or almost obtuse, about 2 lines long, with a prominent keel. Stamens 3. Utricle longer than the glume, acuminate, contracted into a stipes at the base, many-nerved. Hooked bristle not twice as long as the utricule. Nut shorter.—Hook. f. Fl. Tasm. ii. 102, t. 152 B; F. Muell. Fragm. viii. 152; *Carex riparia*, Poir. Dict. Suppl. iii. 282.

Victoria. Upper Hume River and Mount Kosciusko at an elevation of 3000 to 4000 ft., *F. Mueller*.

Tasmania. Derwent River, *R. Brown*; Cuming's Head, *Archer*; Southport, *C. Stuart*.

4. **U. debilior**, *F. Muell. Fragm.* viii. 151.—Stems filiform, 6 in. to above 1 ft. long. Leaves usually longer, very narrow linear, tapering into long filiform points. Spikelet linear, slender, $1\frac{1}{2}$ to 2 in. long. Glumes rather distant especially the lower ones, narrow linear-lanceolate, $1\frac{1}{4}$ to 2 lines long, 3-nerved, the lowest produced into a filiform leaf often several inches long. Male flowers rather numerous. Stamens 3. Utricle narrow, exceeding the glume, but not seen far advanced. Hooked bristle nearly twice as long as the glume.

N. S. Wales. Lord Howe's Island, summit of Mount Gower, *Fullagar*. Very closely allied to the New Zealand *U. leptostachya*, differing slightly in the more acuminate glumes.

32. CAREX, Linn.

Flowers unisexual, in unisexual or androgynous spikelets. Glumes imbricate all round the rhachis. Stamens in the males 3 or rarely fewer, without hypogynous bristles or scales. Ovary in the females enclosed in a bottle-shaped or inflated utricule or perigynium, contracted at the top, with a small oblique or 2-toothed orifice, and at the base of the ovary within the utricule is often a bristle (a barren pedicel) usually very small, not hooked, rarely protruding from the utricule and entirely wanting in many species. Style protruding with 2 or 3 filiform stigmatic branches. Nut flattened or 3-angled, enclosed in the somewhat enlarged persistent utricule.—Perennials with grass-like leaves, mostly radical or on the lower part of the stem. Spikelets either solitary and terminal or few, one terminal the others more or less distant, sessile or pedunculate, or many in a terminal panicle or compound spike. Male flowers collected together in the terminal spikelet or at the upper end rarely at the lower end of the androgynous spikelets. Floral bracts often leaflike under the lower spikelets or branches of the panicle, usually small and glume-like under the upper one, and sometimes under all.

This genus, the largest among Cyperaceæ, is abundant in the temperate and cooler regions of both hemispheres and in mountainous districts within the tropics, with a few species even in the hotter regions. As a genus it is technically separated from *Uncinia* by the absence of the hook to the bristle of the female flower, although in a few species not Australian it occasionally grows out into a flower-bearing peduncle. The genus is widely separated from all others by the utricule as well as by habit. The species are however very difficult to classify and define. Dr. Boott's admirable illustrations as well as his specimens and careful descriptions have given the greatest facilities for their identification, but he had unfortunately not yet published his views as to their general arrangement.

Spikelet solitary, terminal, androgynous.

Spikelet ovate, many-flowered. Style-branches 2 . . . 1. *C. cephalotes*.

Spikelet small, 2- to 4-flowered. Style-branches 3.

Outer bract elongated subulate 2. *C. acicularis*.

- Spikelet many-flowered. Upper half male, slender; lower half nearly globular, female, with spreading utricles. Style-branches 3 3. *C. capillacea*.
- Spikelets usually few, androgynous, in a short terminal spike. Style-branches 2.
- Spikelets 3 to 5, male at the base or sometimes wholly female.
- Spikelets ovate, green or pale coloured.
- Outer bract much longer than the inflorescence 4. *C. inversa*.
- Outer bracts very short.
- Utricle scarcely beaked 5. *C. canescens*.
- Utricle with a long spreading or recurved beak 6. *C. echinata*.
- Spikelets oblong. Glumes dark purple 7. *C. hypandra*.
- Spikelets 6 to 12, male at the top, the spike sometimes compound at the base 8. *C. chlorantha*.
- Spikelets numerous, androgynous, in a long narrow panicle.
- Panicle very narrow and spikelike, the partial spikelike branches short and erect. Style-branches 2.
- Stem 3-angled. Utricle ciliate on the angles, with a very short beak 9. *C. paniculata*.
- Stem 3-angled. Utricle not ciliate, with a long beak 10. *C. declinata*.
- Stem terete or nearly so 11. *C. tereticaulis*.
- Panicle narrow but loose, the short branches spreading. Style-branches 3 12. *C. fissilis*.
- Panicle loose. Spikelets not so numerous as in the preceding species and $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Style-branches 2 13. *C. gracilis*.
- Spikelets 3 to 6 or rarely more, the terminal one male, the lower ones female or shortly male at the top and distant. Style-branches 2.
- Spikelets all sessile or the lowest scarcely pedunculate. Glumes mostly obtuse. Spikelets under 2 in.
- Spikelets pale-coloured. Utricle abruptly contracted into a short truncate beak 14. *C. contracta*.
- Spikelets dark coloured. Utricle not beaked or tapering into a short beak 15. *C. vulgaris*.
- Glumes acute. Spikelets mostly above 2 in. 16. *C. acuta*.
- Spikelets all pedunculate, narrow, dark brown 17. *C. loboepispis*.
- Spikelets 3 to 6 or rarely more, the terminal one male or female at the top, the lower ones chiefly female and sessile or the lowest shortly pedunculate. Style-branches 3.
- Terminal spikelet male, short and slender. Female ones ovoid-globular. Utricles with long spreading beaks 18. *C. flava*.
- Terminal spikelet female at the top. Female ones oblong or cylindrical, not very distant. 19. *C. Buxbaumii*.
- Terminal spikelet male, cylindrical. Female ones oblong or cylindrical, distant.
- Stems 3 to 8 in. Leaves usually longer, tufted.
- Female spikelets mostly with a few males at the base.
- Utricles corky, ovoid, with short beaks, 3 lines long 20. *C. pumila*.
- Utricles not corky, ovoid, with short beaks, $1\frac{1}{2}$ lines long. Eastern species 21. *C. breviculmis*.
- Utricles not corky, ovoid, distinctly beaked, 1 to $1\frac{1}{2}$ lines long. Western species 22. *C. Preissii*.

- Stems mostly 1 ft. or more. Leaves rarely longer.
 Female spikelets usually without males.
 Utricles with long beaks, obscurely nerved . . . 23. *C. Gunniana*.
 Utricles scarcely beaked, very prominently nerved 26. *C. Brownii*.
 Terminal male spikes several, clustered, rich brown.
 Stems 1 to 2 ft. 24. *C. Bichenoviana*.
 Spikelets several, cylindrical, the terminal male, the lower
 ones female or chiefly so and mostly pedunculate.
 Style-branches 3. Stems tall.
 Utricle ovoid, usually dark-coloured, scarcely beaked,
 very prominently many-nerved.
 Glumes ovate or oblong, obtuse 25. *C. maculata*.
 Glumes narrow, acute or with long points 26. *C. Brownii*.
 Utricle tapering into a distinct beak. Peduncles
 usually long.
 Spikelets erect, solitary, long and loose. Glumes
 narrow, acute or aristate 27. *C. alsophila*.
 Spikelets erect or scarcely spreading, usually 2 or
 more from the same sheath. Glumes rather
 broad, acuminate or aristate 28. *C. longifolia*.
 Spikelets spreading or pendulous. Glumes and
 utricles tapering into long points 29. *C. pseudocyperus*.

1. ***C. cephalotes*, F. Muell. in Trans. Phil. Soc. Vict. i. 110 and in Hook. Kew Journ. viii. 335.**—Stems slender, usually 2 to 4 in. high. Leaves mostly shorter, very narrow. Spikelets androgynous, solitary, erect, compact, at first ovoid, oblong when fully out, 3 to 4 lines long. Male flowers few at the apex, their glumes scarcely projecting beyond the females. Female glumes ovate, obtuse, scarcely above 1 line long, brown with a prominent midrib and hyaline margins. Utricle rather longer, ovate, much flattened, contracted at the base but scarcely stipitate. Style-branches 2. Nut much flattened, rather shorter than the utricles, very shortly stipitate.—Boott, Ill. Car. iv. 148, t. 477.

Victoria. Munyang Mountains and Mount Kosciusko, at an elevation of 6000 to 7000 ft. *F. Mueller*

Very closely allied to the northern *C. pyrenaica*, which is also in New Zealand but not in Australia, the *C. cephalotes* differs in the shape of the spikelet and glumes and the constantly 2-branched style. I cannot identify it with the *C. capitata*, Linn. as proposed by F. Mueller, Fragm. viii. 251.

2. ***C. acicularis*, Boott in Hook. Fl. Nov. Zel. i. 280, t. 63; Ill. Car. iv. 157, t. 508, f. 2.**—Stems 3 to 4 in. high, slender, branching at the base. Leaves usually shorter, subulate or filiform. Spikelet solitary, 2 to 3 lines long, consisting of 2 to 4 female flowers and about as many or only 1 male. Glumes lanceolate, acute or the upper ones obtuse, brown with a greenish keel, the lowest one and sometimes the next also produced into a subulate erect leafy lamina. Utricle narrow, shortly stipitate, produced into a rather long beak, exceeding the glume and slightly 2-fid. Style-branches 3. Nut 3-angled.—*C. Archeri*, Boott in Hook. f. Fl. Tasm. ii. 98, t. 150, Ill. Car. iv. 156, t. 508, f. 3; *C. pyrenaica*, F. Muell. Fragm. viii. 251, not of Wahleub.

Victoria. Summit of Mount Hotham, at an elevation of 7000 ft. *F. Mueller*.

Tasmania. Cumming's Head, *Archer*.

The Victorian specimens, with 3 or 4 male flowers as well as females, resemble the New Zealand ones. Archer's Tasmanian ones are more slender, with the spikelets reduced to 1 or 2 males and 2 or 3 females, but appear to represent a depauperated state of the same plant. The erect subulate bract, besides the size of the spikelet and other minor characters, readily distinguish it from *C. pyrenaica*.

3. *C. capillacea*, Boott, Ill. Car. i. 44, t. 110.—Stems filiform, 6 in. to 1 ft. high. Leaves shorter or a few nearly as long, filiform. Spikelet solitary, 3 to 4 lines long, the upper half male and very narrow, the lower half female, much broader and almost globular, the flowers all close together. Glumes ovate, scarcely 1 line long, obtuse or the lowest with a very short point, the females very broad with scarious margins, the males narrower. Utricle sessile, spreading, ovoid, more or less triquetrous, tapering into a very short entire beak, slightly several-nerved. Style-branches 3. Nut 3-angled, shorter than the utricle.—Bœckel. in Linnæa, xxxix. 37; *C. simplicissima*, F. Muell. Fragm. ix. 191.

N. S. Wales. Clarence River, *Wilcox*.

Also in the eastern Himalayas, Sikkim and Bootan.

4. *C. inversa*, R. Br. Prod. 242.—Stems in the typical form from a few inches to above 1 ft. high. Leaves shorter, narrow. Spikelets 3 to 5, all sessile in a terminal cluster or short spike, rarely reduced to a single one, or with an additional axillary one rather lower down, all usually androgynous, ovate, 3 to 6 lines long. Outer leaflike bracts 1 to 3, longer than the inflorescence. Glumes very thin and almost hyaline, with a green 1- or 3-nerved keel. Male flowers at the base of the spikelet sometimes numerous occupying half the spikelet, more frequently few only and sometimes quite deficient, rarely 1 or 2 males at the end of the spikelet. Female flowers usually rather numerous. Utricle much flattened, $1\frac{1}{2}$ to 2 lines long including the beak, ovate or obovate, several-nerved, with green ciliate edges, tapering into a bifid beak short in the typical form, nearly as long as the utricle in the larger variety. Style-branches 2. Nut much flattened, nearly sessile.—Boott, Ill. Car. iv. 151, t. 486 to 488; Hook. f. Fl. Tasm. ii. 99; Bœckel. in Linnæa, xxxix. 69; F. Muell. Fragm. viii. 252.

Queensland. Brisbane and Dawson Rivers, *F. Mueller*; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, n. 543, *Woolfs*; New England, *C. Stuart*; Hastings and Macleay Rivers, *C. Moore*; Head of the Gwydir, *Leichhardt*.

Victoria. Wendu Vale, *Robertson*; Yarra, Mitta Mitta and Hume Rivers, Mount Buller, Darebin Creek, *F. Mueller*; Creswick, *Whan*; Ballarat, *Bacchus*.

Tasmania. South Esk River, *Gunn*.

S. Australia. Mount Barker, *F. Mueller*.

W. Australia. *Drummond*, n. 922.

Var. major. Stems $1\frac{1}{2}$ to $2\frac{1}{2}$ ft. high. Utricles 2 lines long, prominently nerved, with a long beak.—Brisbane River, *F. Mueller*; Clarence River, *Wilcox*.

The species is also in New Zealand.

5 **C. canescens**, Linn.; Boott, Ill. Car. iv. 154, t. 496.—Stems 4 to 9 in. high. Leaves often as long, usually broader and thinner than in *C. inversa*. Spikelets 3 to 8, sessile, either distant or crowded in a terminal spike, androgynous, ovate, 2 to 3 lines long. Subtending bracts small with very short points, or rarely the lowest with a subulate point longer than the spikelet. Glumes usually very thin and often hyaline, obtuse or with a short point. Male flowers few at the base of the spikelet and often a male and a female within the same glume, each with its own small secondary glume. Females rather numerous. Utricle about 1 line long, ovate, compressed, contracted into a very short beak. Bristle within the utricle sometimes long and rigid or dilated and glume-like, but often small or obsolete. Style-branches 2. Nut flattened.—Bœckel. in Linnæa, xxxix. 122; F. Muell. Fragm. viii. 255.

Victoria. Mount Baw-Baw and Munyang Mountains, F. Mueller.

Also in the northern and Alpine Europe, Asia and America, and in extra-tropical South America.

6 **C. echinata**, Murr.; Bœckel. in Linnæa, xxxix. 124.—Stems tufted, rarely above 6 to 8 in. high. Leaves as long or longer in Australian specimens, shorter in northern ones. Spikelets 3 or 4, rarely 5, either close together in a terminal spike or more frequently at some distance from each other, all sessile, androgynous, 2 to 3 lines long, at first oval-oblong, but ovoid-globular when the fruits have spread. Subtending bracts glume-like with short awns or points. Glumes ovate, acute, hyaline. Male flowers very few at the base of the spikelets or sometimes none. Females several. Utricle longer than the glume, very spreading, ovate or ovate-lanceolate, more or less flattened, with acute angles or narrow wings, and a long straight slender beak. Style-branches 2.—F. Muell. Fragm. viii. 252; *C. stellulata*, Gooden.; Kunth, Enum. ii. 399; Reichb. Ic. Fl. Germ. t. 214.

Victoria. Munyang Mountains, F. Mueller.

Extends over the temperate and cooler regions of the northern hemisphere.

7 **C. hypandra**, F. Muell. Fragm. viii. 259.—Stems in the specimens seen about 4 in. high. Leaves as long or rather longer, about 1 line broad. Spikelets 4, sessile in a terminal spike, the lowest scarcely pedunculate, the terminal one at least androgynous, oblong, 5 to 6 lines long. Lowest bract leaflike in one specimen, very short in the other. Glumes almost black, scarcely 1 line long, ovate, obtuse. Male flowers several at the base of the terminal spike, few or none at the base of the others. Utricle very flat, ovate, rather acute but not beaked, longer than the glume and contrasted with it by its pale colour but quite glabrous. Style-branches 2.

Victoria. Munyang Mountains, at an elevation of 6000 to 7000 ft., F. Mueller.

Of this I have only seen two specimens. It is certainly as observed by F. Mueller, very near the northern *C. bicolor*, All., but that species has the lower spikelets distinctly pedunculate and shorter, broader, more obtuse and evidently canescent utricles.

8. ***C. chlorantha***, *R. Br. Prod.* 242.—Stems usually under 6 in. but sometimes above 1 ft. high. Leaves much shorter. Spikelets 6 to 12, sessile in a dense terminal spike of $\frac{1}{2}$ to 1 in. or rarely rather longer and interrupted at the base, and then slightly compound with more numerous spikelets, the spikelets all or mostly androgynous, ovoid-oblong, 2 to 3 lines long, usually brown. Outer bracts glume-like or rarely the lowest with a subulate lamina nearly as long as the inflorescence. Glumes ovate, 1 to $1\frac{1}{4}$ lines long, acute or mucronate, the keel usually green. Male flowers few at the top of the spikelet. Utricle as long as the glume, much flattened, the edges ciliate, tapering into a short 2-toothed beak. Style-branches 2. Nut flat.—Hook. f. Fl. Tasm. ii. 99, t. 150; Boott, Ill. Car. iv. 171, t. 580, B; F. Muell. Fragm. viii. 256.

N. S. Wales. Port Jackson, *R. Brown*.

Victoria. Ballan, Latrobe and Snowy Rivers, *F. Mueller*; Ballarat, *Bacchus*.

Tasmania. Northern parts of the island, *Gunn*, *Archer* and others; Mount Wellington, *F. Mueller*.

Var. composita. Spike slightly compound at the base, approaching the smaller varieties of *C. paniculata*.—Huron River, *Gulliver*.

9. ***C. paniculata***, *Linn.*; *Kunth, Enum.* ii. 389.—Stems attaining several feet, 3-angled and often very acutely so, or when old more striate with the angles less prominent. Leaves varying from 1 to 4 lines broad, the margins very scabrous. Spikelets androgynous, very numerous in a narrow spike-like panicle, usually 3 to 6 in. long, but sometimes much longer and interrupted at the base, with short erect branches or sessile partial spikes, or occasionally almost reduced to that of the compound variety of *C. chlorantha*. Bract at the base of the panicle small and subulate or obsolete. Spikelets varying from ovoid and scarcely 2 lines to lanceolate and 3 lines long, usually brown, Male flowers sometimes numerous occupying at least the upper half, sometimes few only. Glumes ovate, with short points. Utricle much flattened, ovate, many-nerved, the margins more or less ciliate or denticulate, contracted into a short 2-toothed beak. Style-branches 2.—Reichb. Ic. Fl. Germ. t. 223; *C. appressa*, *R. Br. Prod.* 242; Sieb. Agrostoth. n. 15; Nees in Pl. Preiss. ii. 94; Hook. f. Fl. Tasm. ii. 99; Boott, Ill. Car. i. 46, t. 119, 120; Bœckel. in Linnæa, xxxix. 99; *C. virgata*, Soland.; Boott, l. c. t. 121, 122, Bœckel. l. c. 98; *C. halmaturina*, Bœckel. l. c. 100, partly.

Queensland. Rockhampton, *O'Shanesy* and others.

N. S. Wales. Port Jackson, *R. Brown*, and many others; New England, *C. Stuart*, *Leichhardt*; Hastings River, *C. Moore*; Clarence River, *Wilcox*.

Victoria. From the South Australian frontier to Gipps' Land, *F. Mueller*, *Robertson* and others.

Tasmania. Port Dalrymple and Kent's Group, *R. Brown*; abundant in open forest land, etc., *J. D. Hooker* and others.

W. Australia. Drummond, n. 216, 272; Capel River, *Oldfield*.

Var. subdiaphana. Leaves very long and glumes pale as in *C. declinata*, but the utricles broad and ciliate as in *C. paniculata*.—Queensland, *Hartman*; Rockhampton, *Thozet*.

I have followed the example of F. Mueller, Veg. Chath. Isl. 57, in uniting the common Australian and New Zealand *C. appressa* with the *C. paniculata* of the northern hemisphere, as indeed was already suggested by R. Brown in his herbarium, by the note *C. paniculata* being on all his labels.

10. *C. declinata*, Boott, Ill. Car. iv. 171, t. 580.—Very closely allied to *C. paniculata*, with the same triquetrous stems, scabrous foliage, inflorescence and short androgynous spikelets male at the top, but the glumes are more membranous, almost white, and the utricle narrower, much less flattened, tapering into a long beak, neither ciliate nor denticulate. Leaves often longer than the stem.—F. Muell. Fragm. viii. 257.

Queensland. Brisbane River, F. Mueller, Bailey.

N. S. Wales. Blue Mountains, Mrs. Calvert; Mount Royal and Narrum-Narrum, Leichhardt.

11. *C. tereticaulis*, F. Muell. Fragm. viii. 256.—This also is very closely allied to *C. paniculata*, and ought perhaps to be included amongst its varieties. It differs in the stems terete or nearly so, and never so prominently 3-angled, the leaves very narrow and the inflorescence often longer. Spikelets and utricles precisely as in *C. paniculata*.

Victoria. Axe and Hopkins Rivers and Mount Disappointment, F. Mueller; Portland, Walter; Ararat, Green; Mount William, Sullivan.

Tasmania. Perth, C. Stuart.

S. Australia. Ranges around St. Vincent's Gulf, F. Mueller, Blandowski, and others; Port Lincoln, J. S. Browne.

W. Australia. Drummond, n. 923; Preiss, n. 1866; Tweed River, Oldfield.

C. halimaturina, Boeckl. in Linnæa, xxxix. 100, is founded chiefly on specimens referred by F. Mueller to *C. tereticaulis*, although, from his describing the stems as 3-angled, he probably would include also the varieties of *C. paniculata* with long panicles.

12. *C. fissilis*, Boott, Ill. Car. ii. 86. t. 245.—Stems 2 ft. high or more. Leaves long, 3 to 4 lines broad. Bracts at the base of the lower branches of the panicle leaflike. Panicle narrow, loose and compound, 6 to 8 in. long, consisting of 1 terminal and 3 or 4 distant partial panicles, often 2 together from the axil of the same leafy bract, all narrow pyramidal, the rhachis ciliate on the angles. Spikelets numerous, sessile along the smaller branches but not crowded, 3 to 5 lines long, androgynous, with rather numerous male flowers at the top and usually 3 or 4 females at the base. Glumes membranous, ovate or lanceolate, more or less aristate, the males narrower, and 1 or 2 empty glumes at the base of the spikelet. Utricle narrow, curved, prominently striate, $1\frac{1}{4}$ to $1\frac{1}{2}$ lines long including the long acuminate beak. Style-branches 3.—*C. indica*, F. Muell., but scarcely of Linn.

Queensland, Eaves; Rockingham Bay, Dallachy. The species is also in Anciteum (New Caledonia) whence were the specimens described and figured by Boott. The Queensland ones agree with them, except that the spikelets are rather smaller. The species is certainly very near *C. indica*, Linn., and *C. benghalensis*, Roxb., but does not precisely match with any of our specimens or of Boott's figures, differing from all in the shape of the utricle.

C. Dietrichia, Bœckel. in Flora, 1875, 122, from Port Mackay, *Amalia Dietrich*, is from the character given, probably the same species.

13. **C. gracilis**, *R. Br. Prod.* 242.—Stems slender, 1 to 2 ft. high. Leaves long and narrow. Spikelets rather numerous but narrow and $\frac{1}{2}$ to $\frac{3}{4}$ in. long, erect or scarcely spreading in a narrow simple panicle, mostly androgynous, male at the top, shortly pedunculate and clustered 2 or 3 together, the floral bracts short and subulate, or the lowest much lower down and leaflike with 2 longer peduncles in its axil, one of them bearing 2 or 3 spikelets. Glumes lanceolate or ovate-lanceolate, acute acuminate or shortly aristate. Utricle almost sessile, flattened, ovate, very prominently many-nerved, pubescent, with a long beak.—Boott, *Ill. Car.* i. 59, t. 154, 155; F. Muell. *Fragm.* viii. 250.

Queensland. Brisbane River, *Bailey*.

N. S. Wales. Grose River, *R. Brown* (a particularly slender narrow-leaved form); New England, *C. Stuart*; Macleay River, *Beckler*; Lord Howe's Island, *C. Moore*, *Fullagar*.

14. **C. contracta**, *F. Muell. Fragm.* viii. 258.—Stems rather slender, 1 to 2 ft. long. Leaves long and narrow, the floral leaves or bracts short and subulate or the lowest long and leaflike. Spikelets 3 to 6, all rather distant, erect and sessile, or the lowest shortly pedunculate, the terminal one male, slender, 1 to 2 in. long, the others usually shorter, female or rarely with a few male flowers at the top. Glumes narrow, obtuse or almost acute, thin and brown or hyaline, with a green centre or midrib. Utricle much flattened, with nerve-like margins, ovate or elliptical, about $1\frac{1}{2}$ lines long, shortly stipitate and contracted into a very short truncate or scarcely 2-toothed beak, with 3 or 4 prominent nerves on each face. Style-branches 2. Nut flat, nearly orbicular, much shorter than the utricle.

N. S. Wales. Tenterfield and Timbarra, New England, *C. Stuart*.

Scarcely distinct from the New Zealand *C. Raoultii*, Boott, *Ill. Car.* iii. 109, t. 333, and very near some forms of *C. vulgaris*.

15. **C. vulgaris**, *Fries, var. Gaudichaudiana*, Boott, *Ill. Car.* iv. 169, t. 567.—Stems tufted or emitting creeping stolones, from a few inches to 2 or 3 ft. high. Leaves often longer than the stem and usually narrow, the outer sheaths usually without blades and sometimes split up into filaments. Spikelets 3 to 5, rarely more or fewer, all sessile or the lowest scarcely pedunculate and erect, varying from $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, near together or more frequently rather distant, the terminal one and sometimes a second smaller one immediately under it male, the others female or sometimes with a few male flowers at the top. Glumes dark brown or black, obtuse or very shortly mucronate, often with a green midrib. Utricle very flat, from orbicular to ovate, usually longer than the glume, more or less distinctly several-nerved, obtuse acute or tapering into a short beak. Style-branches 2.—F. Muell. *Fragm.* viii.

257; *C. Gaudichaudiana*, Kunth, Enum. ii. 417; Hook. f. Fl. Tasm. ii. 99, t. 151 A; *C. cæspitosa*, R. Br. Prod. 242, and of most early authors.

Queensland. Brisbane River, *Bailey*.

N. S. Wales. Port Jackson, *R. Brown*; Liverpool Plains, *A. Cunningham*; New England, *C. Stuart*; Macleay River, *C. Moore*.

Victoria. Numerous localities both in low lands and in the mountains, *F. Mueller* and others; Glenelg River, *Robertson*; Mount William, *Sullivan*.

Tasmania. Port Dalrymple, *R. Brown*; abundant both in low lands and the mountains, *J. D. Hooker*.

S. Australia. From St. Vincent's Gulf to the Murray River, *F. Mueller* and others.

The species is abundant and widely spread over the temperate regions of the northern hemisphere. Its numerous varieties have been detailed at considerable length by Boott, l.c. The Australian form which is also in New Zealand, though correctly reduced by Boott to the comprehensive *C. vulgaris*, Fries, appears to me nevertheless to be quite as distinct from some of its northern forms as they are from the special Scandinavian form to which Fries would limit the *C. cæspitosa*, Linn., and after much examination and comparison I cannot refrain from the conclusion I had formerly come to that the whole, after Goodenough and R. Brown and other older authors, ought to be reunited under the Linnean name of *C. cæspitosa*.

16. **C. acuta**, Linn.; Kunth, Enum. ii. 412.—A tall species, very closely allied to the larger varieties of *C. vulgaris*, the spikelets usually longer and more numerous and the glumes narrow and acute or short and aristate. Stems attaining several feet. Leaves longer and rather broad, the lower floral ones or leafy bracts often longer than the inflorescence. Spikelets narrow, $1\frac{1}{2}$ to 4 in. long, 1 to 4 upper ones male and near together, 3 to 5 lower ones more distant and female or the upper ones with a few male flowers at the top, all erect and sessile or the lower ones shortly pedunculate. Glumes oblong-lanceolate or linear or short and tapering to a fine point, dark with a light-coloured midrib unless when very narrow, the females more acute or aristate than the males. Utricle very flat, varying as in *C. vulgaris* from ovate and obtuse to ovate-elliptical and very-shortly beaked, more or less distinctly several-nerved.—Boott, Ill. Car. iv. 165, t. 548 to 556; F. Muell. Fragm. viii. 259; *C. Cunninghamii*, Boott, Ill. Car. iv. 171, t. 579; *C. polyantha*, F. Muell. in Trans. Phil. Soc. Vict. i. 110, and in Hook. Kew Journ. viii. 334.

Queensland. Moreton Bay, *Leichhardt*.

N. S. Wales. Banks of Tuon River, *A. Cunningham*; New England, *C. Stuart*; Clarence River, *Wilcox*.

Victoria. Valleys near Mount Hotham, *F. Mueller*.

The species is spread over Europe, Northern Asia and North America. The Australian form has rather longer and more numerous spikelets than usual in the northern ones, but I can find no other difference, and some European specimens appear to be quite similar.

17. **C. lobolepis**, F. Muell. Fragm. viii. 258.—Stems 1 to 2 ft. high, slender but rigid. Leaves sometimes as long, the sheaths bordered by a scarious membrane at length torn into shreds. Lower floral leaves or bracts longer than the inflorescence, with very short

sheaths. Spikelets 4 to 6, cylindrical, narrow, $1\frac{1}{2}$ to nearly 2 in. long, the terminal one male or with a few female flowers at the top, the others female or with a few males at the top or at the base, all pedunculate, at first erect, but spreading or pendulous when in fruit. Glumes a rich brown, obtuse emarginate or shortly 2-lobed, the prominent midrib often produced into a short point. Utricle sessile, ovate, flat, rather acute but not beaked, faintly several-nerved. Style-branches 2.

N. S. Wales. New England, *C. Stuart*, *C. Moore*.

Not matched with any extra-Australian species, though apparently in some measure allied to the North American *C. crinita*.

18. ***C. flava*, Linn.; Kunth, Enum. ii. 446.**—Stems under 6 in. in the Australian specimens, often longer in northern ones, but rarely attaining 1 ft. Leaves as long or longer in the small varieties. Spikelets 3 to 5, the terminal one male, narrow, 3 to 5 lines long, all the others female, sessile, ovoid or globular, crowded under the male spikelet or the lower ones more or less distant. Glumes oblong, obtuse, thinly membranous, pale coloured and often hyaline on the margins. Utricles longer than the glume, very spreading or reflexed, ovoid, rather turgid, tapering into a rather long beak, prominently several-nerved. Style-branches 3.—Reichb. Ic. Fl. Germ. t. 273; *C. cataractæ*, R. Br. Prod. 242; Hook. f. Fl. Tasm. ii. 101, t. 151; Boott, Ill. Car. iv. 204.

Tasmania. Port Dalrymple, *R. Brown*; Alpine marshes, *Gunn*, *Archer*; Swanport, *Story*.

Boott has already expressed his opinion that the Tasmanian plant is scarcely to be distinguished from the *C. flava*, widely distributed over the temperate regions of the northern hemisphere, and although in some specimens the beak of the utricle is rather shorter, others appear to be quite similar to such of the northern forms as have the spikelets approximate. Story's specimens have smaller utricles like those of the northern var. *Rœderi*.

19. ***C. Buxbaumii*, Wahlenb.; Kunth, Enum. ii. 432.**—Stems often tufted but emitting creeping stolones, 1 to 2 ft. high. Leaves rather long, but usually shorter than the stem. Spikelets 3 or 4, in a terminal spike but not very close, oblong or cylindrical, 3 to 9 lines long, all erect and sessile or the lowest very shortly pedunculate, the terminal one androgynous, the male flowers at the base few only or occupying nearly the whole spikelet, the lower ones female. Outer leafy bract often as long as the inflorescence. Glumes 2 to nearly 3 lines long, ovate-lanceolate, the keel produced into a fine rigid point. Utricle ovate-elliptical, compressed or 3-angled but with obtuse edges, about $1\frac{1}{2}$ lines long, not beaked, the orifice entire or minutely 2-toothed. Style-branches 3.—Boott, Ill. Car. iv. 136, t. 438, 439; Bœckel. in Linnæa, xl. 396; F. Muell. Fragm. viii. 252.

Victoria. Alpine boggy pastures between Mount Hotham and the Cabonga River and between Lake Omeo and Snowy River, *F. Mueller*.

Extends over Europe, Northern Asia and North America; the Australian specimens have generally longer and longer-pointed glumes than the northern ones, but closely resemble a few of Hoppe's from South Germany.

20. *C. pumila*, Thunb.; Boott, Ill. Car. iv. 217.—Rhizome often creeping in the sands to a great extent. Stems 4 to 8 in. high. Leaves much longer, more rigid than in *C. breviculmis*, tapering into long subulate points. Spikelets 3 to 6, the terminal one male, narrow, $\frac{3}{4}$ to rather above 1 in. long with often 1 or 2 smaller male ones immediately below it, the lower ones female or with a few male flowers at the top, distant, sessile or the lowest shortly pedunculate, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Lower outer bracts leaflike and sometimes very long, the upper ones subulate or small. Glumes at the time of flowering ovate-oblong or lanceolate, usually purple, with scarious or hyaline margins, the keel prominent and more or less produced into a point, often enlarged under the fruit brown and acuminate. Utricle larger than in the allied species and of a thick corky substance, ovoid, nearly 3 lines long, shortly contracted at the base, faintly nerved, tapering into a short bifid beak. Style-branches 3.—F. Muell. Fragm. viii. 251; *C. littorea*, Labill. Pl. Nov. Holl. ii. 69, t. 219; R. Br. Prod. 243; Hook. f. Fl. Tasm. ii. 100.

Queensland. Moreton Island, *McGillivray, F. Mueller.*

N. S. Wales. Hastings River, *Beckler*; Clarence River, *Beckler, Wilcox.*

Victoria. Sandy sea-shores and also grassy river banks; inland in numerous localities along the principal rivers, *F. Mueller*; Portland and Wendu River, *Robertson*; Glenelg River, *Allitt*; Wimmera, *Dallachy.*

Tasmania. Port Dalrymple, *R. Brown*; sandy shores, common, *J. D. Hooker* and others.

S. Australia. Crystal brook, Torrens and Gawler Rivers, *F. Mueller.*

Also in New Zealand, along the eastern coasts of Asia and in extratropical South America.

21. *C. breviculmis*, R. Br. Prod. 242.—Stems usually only a few inches high but in northern specimens 1 ft. or more. Leaves in most of the Australian specimens longer than the stem, the lower floral bracts often very long and narrow, the upper ones or very rarely all short and subulate. Spikelets 2 to 5, narrow-cylindrical, mostly about $\frac{1}{2}$ in. long and rather loose, the terminal one male, the lower ones female or 1 or more of them with male flowers in the upper half, all erect and sessile or the lowest shortly pedunculate, distant or the upper ones crowded together. Glumes loosely imbricate, thinly membranous, the females with a prominent keel produced into a fine point, the males obtuse or shortly mucronate. Utricle shortly stipitate, ovoid, usually longer than the glume but shorter than its point, very faintly or more distinctly many-nerved, glabrous or minutely pubescent, with a rather long conical beak. Style-branches 3.—Boott, Ill. Car. iv. 181; Hook. f. Fl. Tasm. ii. 101, Fl. Nov. Zel. t. 63; F. Muell. Fragm. viii. 255; *C. Royleana*, Boott, Ill. Car. i. 6, t. 19.

N. S. Wales. Port Jackson, *R. Brown* (small dwarf specimens), *Woolfs*; New-

castle, *Leichhardt*; Lord Howe's Island, top of Mount Lingbird, *C. Moore*; high on Mount Gower, *Fullagar*.

Victoria. Wendu Vale, *Robertson*; Yarra River, Darebin Creek and Munyang Mountains, *F. Mueller*.

Tasmania. *Gunn*; Cheshunt, *Archer*.

Also in New Zealand, the Himalayas and Japan.

22. **C. Preissii**, *Nees in Pl. Preiss.* ii. 94.—Scarcely distinct from *C. breviculmis*. Stems tufted, under 1 ft. high, slender. Leaves often longer, narrow, the lower floral ones or outer bracts similar, the upper ones smaller or glume-like. Spikelets 3 to 6, cylindrical, the terminal one male, $\frac{1}{2}$ to $\frac{3}{4}$ in. long and often close to it 1 or 2 small androgynous ones, the others distant, either androgynous with a few male flowers at the top or entirely female, all erect and sessile or on very short peduncles. Male glumes oblong, obtuse or mucronate, with scarious margins and a 1- or 3-nerved centre, the female glumes shorter, broader and more acute. Utricles rather narrow, 3-angled, contracted at the base, tapering into a short beak, the angles often serrulate-ciliate, the sides rather faintly nerved. Style-branches 3.—*Boott*, *Ill. Car.* i. 68, t. 186; *F. Muell. Fragm.* viii. 251; *C. thecata*, *Boott* in *Trans. Linn. Soc.* xx. 143.

W. Australia. Swan River, *Drummond* 1st coll. and n. 921, *Preiss*, n. 1861, *Oldfield*; Rottenest Island, *Preiss*, n. 1825; Vasse River, *Pries*.

23. **C. Gunniana**, *Boott in Trans. Linn. Soc.* xx. 143, *Ill. Car.* i. 68, t. 185.—Stems 6 in. to 2 ft. high. Leaves often as long, narrow or rather broad, the lower floral ones or outer bracts similar, the upper smaller, but all except the last longer than the inflorescence. Spikelets 3 to 6, cylindrical, the terminal one male, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, and sometimes 1 or 2 small male ones close under it, the others female and distant or the uppermost close to the males, all erect sessile or shortly pedunculate and as long as the terminal one. Male glumes oblong or almost ovate, obtuse or acute, with scarious margins, the prominent keel usually produced into a point; female glumes shorter, broader, with a longer point. Utricle obtusely 3-angled, rather turgid, rounded at the base, tapering into a rather long acute 2-toothed or 2-cleft beak, the nerves scarcely prominent. Style-branches 3. Nut broad, shortly stipitate.—*Hook. f. Fl. Tasm.* ii. 100; *F. Muell. Fragm.* viii. 251.

N. S. Wales. Darling River, *Beckler*.

Victoria. Dargo, Mitchell and Curdie's Rivers, Maroka Valley, Baw-Baw and Munyang Mountains, ascending to 6000 ft., *F. Mueller*.

Tasmania. *Gunn*; Cheshunt, *Archer*.

S. Australia. Mount Lofty Ranges, *F. Mueller*.

C. barbata, *Boott*, *Ill. Car.* i. 68, t. 187, from New Norfolk, *Gunn*, appears to me to be a slight variety of *C. Gunniana*, with darker coloured glumes, but the specimens are in flower only with the utricles not yet full grown. A similar variety with still darker and rather larger glumes was gathered by *F. Mueller* on the Murray River.

24.? **C. Bichenoviana**, *Boott in Hook. f. Fl. Tasm.* ii. 101.—Stems 1 to 2 ft. high. Leaves often as long or longer, the lowest distant

floral ones or outer bracts similar but with very short sheaths, the upper ones small. Spikelets in our specimens 4 to 10 males in a terminal cluster, the central one $1\frac{1}{2}$ in. long, the outer ones much shorter, and 3 or 4 lower down females or androgynous, $\frac{1}{2}$ to 1 in. long, 1 or 2 not very distant, the lowest far down and in one axil is a secondary cluster of male spikelets, all erect, cylindrical, of a rich brown. Glumes obtuse, but the midrib or keel produced into a point. Utricles too young to characterise. Style branches 3.

Tasmania. Woolnorth, *Gunn*. This is evidently a distinct species, although the specimens are too few and not far enough advanced for a full description.

25. ? **C. maculata**, *Boott in Trans. Linn. Soc. xx. 128; Ill. Car. i. 9, t. 26.*—Stems long and weak. Leaves long, the floral ones or outer bracts exceeding the inflorescence, the sheaths bordered by a broad thinly scarious brown membrane. Spikelets several, 3 or 4 usually sessile in a terminal cluster, of which 1 wholly male and 1 to 3 androgynous the male flowers at the top, and 2 to 4 females more or less distant and pedunculate, the lowest often far down on a long slender peduncle, but all erect, cylindrical, mostly about 1 in. long. Glumes ovate or oblong, obtuse or scarcely mucronate, thinly scarious, pale brown or hyaline. Utricles sessile, ovoid, often compressed, rather acute or very shortly beaked, longer than the glume, very prominently several-nerved. Style-branches 3. Nut 3-angled.—*C. neurochlamys*, *F. Muell. Fragm. viii. 258.*

Queensland. Brisbane River, Moreton Bay, *F. Mueller, C. Stuart, Bailey; Rockingham Bay, Dallachy.*

N. S. Wales. Tweed and Richmond Rivers, *C. Moore.*

Also in East India, as identified by *Boott*.

26. **C. Brownii**, *Tuckerm. Enum. Car. 21.*—Stems 1 to 2 ft. long, rather weak. Leaves long, the lowest floral ones or outer bracts often exceeding the inflorescence, the upper ones short and subulate. Spikelets usually 3 or 4, very near together at the end of the stem, erect and sessile or nearly so, but sometimes the lowest more distant and more or less pedunculate, the terminal one male, the others female all $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Glumes more or less scarious, narrow or short and acuminate, the midrib produced into a rather long point. Utricle ovoid, turgid or nearly globular, usually dark-coloured in fruit, rather more than 1 line long, prominently many-nerved, abruptly contracted into a very short 2-toothed beak. Style-branches 3.—*Boott, Ill. Car. iv. 161, t. 532, F. Muell. Fragm. viii. 250; C. striata, R. Br. Prod. 243, Kunth, Enum. ii. 458, Sieb. Agrostoth. n. 16, not of Michaux.*

N. S. Wales. Hunters and Williams Rivers, *R. Brown; Hastings River, C. Moore; Richmond River, Fawcett; Archer's Creek, Leichhardt.*

Victoria. Hume and Curdie's Rivers, *F. Mueller; Ballarat, Bacchus.*

C. lacistoma, R. Br. Prod. 243; Boott, Ill. Car. t. 532, appears to have been correctly referred by F. Mueller, to C. Brownii.

27. **C. alsophila**, *F. Muell. Fragm. viii. 257.*—A tall plant with

the long rather broad leaves of *C. longifolia*, but the floral ones or outer bracts, though very long, without sheaths or with only very short ones. Spikelets 4 to 6, the terminal one male, narrow, 1 to $1\frac{1}{2}$ in. long and rarely 1 or 2 smaller male ones close under it, the remainder female, more or less distant, varying from 1 to 3 in. long, usually loose, solitary in the axils on short or the lower ones on long peduncles. Glumes narrow, acuminate with long points, or the females rather shorter pointed. Utricles 2 to 3 lines long, shortly stipitate, tapering into a rather long beak, resembling those of *C. longifolia* but rather more turgid and more distinctly nerved. Style-branches 3.

Victoria. Mounts Baw-Baw, Arnott and Juliette; Upper Yarra, Tarwan, Latrobe and Goulburn Rivers, ascending to 4000 ft., *F. Mueller*.

28. *C. longifolia*, *R. Br. Prod.* 242.—Stems 2 to 3 ft. high, with long rather broad leaves, the lower floral ones or outer bracts long and leaflike, with long sheaths. Spikelets 6 to 20, the terminal one male, 1 to $1\frac{1}{2}$ in. long, often accompanied by a cluster of shorter ones all male or partially female, the others all pedunculate and female or with a few male flowers at the base or at the top, 1 to 2 in. long, the peduncles slender and usually clustered 2 to 4 together in the axils of the long leaflike outer bracts or floral leaves, the sheaths of the lower ones long. Glumes scarious, rather broad, acuminate or obtuse and aristate, the keel usually prominent. Utricles oblong-elliptical, stipitate, prominently 3-angled, tapering into an entire or 2-toothed beak, nearly 3 lines long including the beak. Style-branches 3. Nut short, prominently 3-angled.—*Boott, Ill. Car.* iii. 108, t. 331, 332; *Sieb. Agrostoth.* n. 14; *Hook. f. Fl. Tasm.* ii. 101; *F. Muell. Fragm.* viii. 250; *C. Brownei*, *Steud. Syn. Glum.* ii. 209.

Queensland. Upper Brisbane River, *F. Mueller*; South Queensland, *Hartmann*.

N. S. Wales. Paterson River, *R. Brown*; Richmond, *Woolfs*; Richmond, Macleay and Clarence Rivers, *Beckler*; Hastings River, *C. Moore*.

Victoria. Ballan, Cobberas Mountains, Tambo River, *F. Mueller*.

Tasmania. Derwent and South Esk Rivers, *Gunn*; Swanport, *Story*.

29. *C. pseudocyperus*, *Linn. ; Kunth, Enum.* ii. 501.—Stems stout, angular, 2 to 3 ft. high. Leaves long, 2 to 5 lines broad. Spikelets 2 to 5, all pedunculate and at length pendulous, but usually near together at the end of the stem, cylindrical, 1 to 2 in. long, the terminal one male, the others female. Outer bracts long and leaflike. Glumes very shortly ovate or lanceolate, tapering into fine points. Utricles when ripe very spreading or reflexed, ovoid-oblong at the base, strongly nerved and tapering into a long rigidly acuminate 2-cleft beak, the whole utricle including the beak varying from 2 to 3 lines, on a very short stipes, rather longer however in the Australian than in most of the northern specimens.—*R. Br. Prod.* 243; *F. Muell. Fragm.* viii. 249; *C. fascicularis*, *Soland.*; *Boott, Ill. Car.* i. 53, t. 139; *Hook. f. Fl. Tasm.* ii. 101.

Queensland. Boyne River, *Hartmann*.

N. S. Wales. Newcastle, *R. Brown*; Paramatta, *Woolfs*; north of Bathurst, *A. Cunningham*; New England, *C. Stuart*; Castlereagh River, *C. Moore*.



Victoria. Wannon River, *Robertson*; Portland, *Allit*; Ballarat, *Day*; Mount Baw-Baw, Goulburn Ranges, Hume River, etc., *F. Mueller*.

Tasmania. Port Dalrymple, *R. Brown*; common in marshy situations, *J. D. Hooker*.

S. Australia. Spencer's Gulf, *R. Brown*; Mount Torrens and Lofty Ranges, *F. Mueller*.

W. Australia. *Drummond*, 1st coll. and n. 924; Karri Dale, *Walcot*.

Widely spread over the temperate regions of the northern hemisphere. In uniting the Australian with the European species I have followed *F. Mueller* as I can find no constant character to separate them. He also adds to the synonyms the New Zealand *C. Forsteri*, *Wahlenb.*, which has usually much smaller utricles but might well be regarded as a variety only.

ORDER CXLIV. GRAMINEÆ.

Flowers hermaphrodite or unisexual, in little green or more or less scarious spikes called *spikelets*, consisting of several scale-like distichous bracts called *glumes*, the two or sometimes 1 or rarely 3 or more lower ones and sometimes 1 or more upper ones empty, the other one or more with one sessile flower in the axil of each. No normal perianth, but the flower usually enclosed in a 2-nerved glume-like scale called a *palea* (supposed to represent the 2 bracteoles of *Hypolytræ* or the perigynium of *Caricæ*), and the perianth probably represented by 2 or rarely 3 small usually very thin and hyaline scales called *lodicules*, the *palea* or the *lodicules* or both deficient in a few genera. Stamens usually 3, occasionally reduced to 2 or 1, in a few genera 6 or more; filaments free, filiform; anthers usually exserted from the spikelet, versatile, ovate oblong or linear, with 2 parallel cells opening longitudinally without any prominent connective. Ovary entire, 1-celled, with 1 erect anatropous ovule. Styles 2 or rarely 3, free or united at the base into a 2- or 3-branched style, the upper stigmatic portion or *stigmas* usually long, either feathery with simple or branched stigmatic hairs, or more rarely simple with the stigmatic hairs very short or reduced to scarcely prominent papillæ. Fruit a small seedlike nut or utricle, often enclosed in the *palea* and subtending glume, the thin membranous pericarp usually closely adnate to the seed and inseparable from it, sometimes adnate also to the enclosing *palea*, in a few genera free and loosely surrounding the seed. Seed erect, albuminous, with a thin adnate testa. Embryo small, usually globular or nearly so, on one side of the base of the albumen.—Herbs usually tufted or decumbent or creeping and rooting at the base, sometimes tall and branching, or in species not Australian, shrubby or almost arborescent. Stems usually hollow between the nodes. Leaves alternate, entire, parallel-veined, usually long and narrow, sheathing the stem at their base, but the sheaths split open from the base opposite the blade and often ending within the blade in a scarious or ciliate appendage called a *ligula*. Inflorescence terminal, rarely also from the sheaths of the upper leaves,

the spikelets variously arranged in spikes, racemes, panicles or heads. Bracts occasionally but rarely subtending the branches of the panicle or single spikelets.

A very large Order, abundantly diffused over the whole world, in almost every variety of station, and supplying many of the most important articles of food and raiment, or applied to a great variety of economical purposes. Of the 102 genera here enumerated, twelve are included only as containing introduced species reported as more or less perfectly naturalised, 90 have species believed or known to be truly indigenous. Of these, no less than 54 extend over both the New and the Old World, 26 of them chiefly tropical, 28 entirely or chiefly extra-tropical or equally distributed in temperate and warm regions, 18 more extend into Asia, a few of them also into Africa and New Zealand, 3 are common to Australia and New Zealand, one extends only to South Africa, and fourteen genera only, most of them small, are endemic in Australia. The introduced species, of which besides the above mentioned 12 introduced genera, there are at least as many belonging to genera with indigenous species, are chiefly of European origin, a very few South African, and one at least Asiatic and another American.

Gramineæ have been the object of special studies of several of the most eminent botanists, amongst which the labours of Brown, of Kunth, and of Trinius have been the most important. But the only general enumeration they have left is that of Kunth, who had not at that time the materials nor yet the leisure to investigate the synonymy, which had already become exceedingly confused. This confusion has been gradually increasing by the large number of species described in partial works, without that general comparison which is especially needed in an Order in which a large proportion of the species have a very wide geographical distribution, and it has become more especially involved through Steudel's more recent hasty and careless compilation (*Synopsis Plantarum Glumacearum*). Nothing therefore is now more needed than a careful and judicious synoptical revision of the whole Order. Such a one is now in progress for De Candolle's *Monographs* by my friend General Munro, who has for a number of years made Gramineæ his special study, as well on living plants in tropical and temperate countries, as on dried specimens from the principal herbaria of the day, and in the correctness of whose views all those who have studied the partial memoirs he has published, feel fully convinced. Without his kind assistance the preparation of this part of my *Flora* would have been doubly laborious. He has however guided me throughout, and although I am far from holding him responsible for the generic and specific arrangement and characters here given, it is to him that I am indebted for many of them, and the whole have been the subject of discussion between us.

The only point on which there may not yet be perfect coincidence between us, is as to the expediency of retaining the terminology I first attempted in my *Handbook of the British Flora*, and which, the more I have studied the Order, the more I see reason to persist in, as explained in some detail in a paper printed in the *Journal of the Linnean Society*, vol. xv. For those who think that Kunth's terminology is still the most convenient, though not the most correct, it may be sufficient to explain, that my *palea* is for them the *upper palea*, my *flowering glume* their *lower palea*, and my *empty glumes* their *glumes* or *neutral flowers*, according as they are theoretically supposed to represent glumes that have never any flower in their axils, or glumes that occasionally in other genera or species enclose an imperfect or perfect flower. I should consider a flower in Gramineæ as perfect (male, female, or hermaphrodite) when it has a palea lodicules and either stamens or pistil or both, rudimentary when reduced to the palea, and no flower at all when even that is absent. This will explain an apparent discrepancy in the same spikelet being described as biflorous (2-flowered) by Kunth, sesquiflorous ($1\frac{1}{2}$ -flowered) by Trinius, and uniflorous (1-flowered) by myself.

Gramineæ, the third Order among phænogamous plants in respect of numbers of species, and probably the most numerous in individuals, are as uniform in the structure of their organs of reproduction as Compositæ, which stand first as to numbers of species (Leguminosæ, the second, being much more varied in their

flowers and fruits). The characters available for their distribution into tribes and genera must be derived therefore chiefly from organs generally regarded as of secondary value, bracts and inflorescence. Hence the great difficulty in assigning definite limits to the groups formed. It has been admitted by most botanists that two great series, the *Panicacæ* and *Poacæ*, as indicated by Brown, are generally distinct, although not differing in flowers or seeds so as to be raised to the rank of sub-orders. But there has been some difference of opinion as to the precise characters to be assigned to them. Brown relied chiefly on the position of the fertile flowers apparently (though not theoretically) terminal, and either solitary or with a male or rudimentary flower below it in *Panicacæ*, whilst in *Poacæ* the rachis is produced beyond the solitary or uppermost fertile flower, either as a bristle or bearing a male or rudimentary flower above it. But this character, if strictly adhered to, would transfer the *Stipacæ*, many *Agrostideæ*, and some others from *Poacæ* to *Panicacæ*, and would widely separate species which are almost if not strictly congeners, such as *Agrostis* from *Deyeuxia*, *Phleum* from *Chilochloa*, *Aira* from *Deschampsia*, or even still more closely allied species as in *Cynodon*. Fries has proposed another character, adopted by some modern botanists, for the two groups, which he terms *Clisantheæ* and *Euryantheæ*, the former with the spikelets closed in flower, the stigmas protruding from the top of the flowering glume, the latter with the spikelets open in flower, the stigmas protruding at the sides or base of the flowering glume. But not only is this character practically useless as it can only be observed on the living plant, many grasses only opening for a few hours in the day, and has indeed been verified only on a certain number of species inhabiting temperate regions, but it cannot be constant in tropical grasses, for I have seen dried specimens of *Panicums* for instance with short styles and the stigmas protruding laterally below the middle of the glumes, nor does it prove natural in as far as actually carried out, since for instance it removes *Sesleria* and a few others from *Poacæ* to *Panicacæ*. Munro, while admitting that both the above characters are general, though not constant, has relied chiefly on a third, which proves to be a much safer practical guide, the articulation of the rachis of the spikelet below the outer glumes (on the pedicel) in *Panicacæ*, above them or rarely none in *Poacæ*. From this character I have observed no deviation, except perhaps in a very few *Phalarideæ*, a tribe distinctly separable on other grounds. It settles also the position of a few genera such as *Polypogon*, *Milium*, *Isachne*, etc., which might at first sight appear closely to connect the two great series.

The arrangement here adopted of the tribes and subtribes is derived generally from the study of Old World especially Australian grasses, and may require some modification when a few American genera, which I have not specially examined, are taken into consideration.

It may be objected by some that I have adopted too many monotypic or small genera, distinguished by characters of no importance, more so than I have done in other instances. But the characters which separate even the larger groups of Gramineæ are necessarily such as would in many Orders be regarded as unessential, and I have been unwilling to reunite on that ground genera distinguished by experienced Agrostologists, where I was unable to give to the combined group a more clearly distinctive character than those which separate the partial ones.

I have not thought necessary to repeat in each generic character the "Stamens 3 or fewer" or the "2 feathery stigmas," so very general in the Order, but have only referred to these organs when anything exceptional has been observed. The peculiarities of the ramifications of the stigmas can rarely be well ascertained from dried specimens, especially among the *Poacæ* where they are so very delicate and evanescent, and if the importance attached to them by some recent botanists be real, that can only be proved when those of tropical and trans-tropical grasses shall have been more extensively examined on living plants.

I have seldom mentioned the lodicules, as, with the exception of the apparently constant presence of the third lodicule in *Stipacæ*, I have not been able to satisfy myself of the generic, or in most cases even of the specific constancy of the forms described. Lodicules appear to be the abortive relics of organs which have lost all physiological functions, and as such are necessarily variable in size and form though constant in position. When thin they disappear after flowering, and are often very

minute, they are therefore very difficult to observe in the dried state, and have indeed been observed in comparatively few species and in very few individuals of each species, and very frequently I have been unable to find the precise forms figured by Kunth and others of whose accuracy there can be no doubt. At any rate they are not yet sufficiently known to form the basis of any practical determination of genera or species.

A. Panicaceæ. (Primary Series rather than Suborder). *Pediceal articulate below the glumes. Spikelet with 1 fertile flower, the male or barren flower, if any, below it.*

TRIBE I. Panicæ. *Fertile spikelets with 1 terminal hermaphrodite or female flower, with or without a male one below it. Glumes 4 or 3, the upper flowering one of a firmer texture, the outer one usually smaller, sometimes wanting. A palea to each flower. Stamens 3, rarely fewer. Grain enclosed in the hardened (rarely thin but stiffened) upper glume and palea. Awns rare, and when present neither twisted nor bent back.*

SERIES I. Spikelets hermaphrodite.

Inflorescence not bracteate. No bristle-like involucre.

Fruiting glume hardened (except in *Panicum myurus*).

Glumes 3 (the outer one deficient).

Spikelets not callous at the base. Flowering glume not awned

1. PASPALUM.

Spikelets with a callous annulus or cup at the base.

Flowering glume with a point or short awn

2. ERIOCHLOA.

Glumes 4.

Outer glume shorter than the others, often minute, not awned

3. PANICUM.

Outer glume with a long awn

4. OPLISMENUS.

Spikelets surrounded by or intermixed with abortive branches of the panicle, forming a lobed or bristly involucre. Fruiting glume hardened.

Spikelets intermixed with long persistent bristle-like branches, and falling off from them

5. SETARIA.

Involucres crowded or distant along a simple rhachis, each enclosing 1 to 3 spikelets and falling off with them.

Involucres of 3 or 4 unilaterally divided branches not completely surrounding the spikelet

6. PLAGIOSETUM.

Involucres of numerous simple or plumose bristles completely surrounding the spikelet.

7. PENNISETUM.

Involucre of several outer bristles and inner flat lobes completely surrounding 1 to 3 spikelets and at length hardened

8. CENCHRUS.

Branches of the panicle produced beyond the base of the last spikelet. Fruiting glume stiff but scarious and rather thin.

Spikelets solitary or few along the slender inarticulate branches of the panicle

9. CHAMÆRAPHIS.

Spikelets few on the very short branches of a spike-like panicle, the common rhachis broad and flat, at length articulate

10. STENOTAPHRUM.

Spikes of few spikelets enclosed at the base in sheathing bracts

11. XEROCHLOA.

SERIES II. Spikelets unisexual. Stems prostrate or divaricate.

Spikelets monœcious in a simple spike, the upper ones male, the lower female

12. THUAREA.

Spikelets dioecious, in dense heads. 13. SPINIFEX.

TRIBE II. **Andropogoneæ**. Fertile spikelets with 1 terminal hermaphrodite or female flower, with or without a male one below it. Glumes 4 or rarely fewer, one of the outer ones the largest enclosing the fruit, the third smaller thin and hyaline sometimes wanting, the upper or flowering one very thin and hyaline, often bearing a twisted and bent awn. A palea to each flower sometimes very small or deficient in the fertile flower. Stamens 3, rarely fewer.

(The awn when present is terminal or between the notches of the flowering glume in all except *Arthraxon*.)

SUBTRIBE I. **Zoysieæ**. Spikelets solitary or rarely in clusters of 2 or 3, inserted all round the inarticulate rhachis of a simple spike or raceme. Awns none on the flowering glume, none or straight on the outer ones.

Spikelets sessile in notches of the rhachis and closely appressed. Glumes 2, smooth 14. ZOYSIA.

Spikelets 2, rarely 3 or 4 together on very short pedicels. Glumes usually 3, the larger one echinate, a minute outer one sometimes wanting and a small hyaline flowering one 15. LAPPAGO.

Spikelets in a dense spike, not awned. Glumes 4, the outer one the largest 16. NEURACHNE.

Spikelets in a loose spike or raceme, very narrow. Glumes 3, the 2 outer ones with straight awns 17. PEROTIS.

SUBTRIBE II. **Rottboellieæ**. Spikelets awnless, in pairs or rarely solitary, in alternate notches of the articulate rhachis of a simple spike, one sessile fertile and more or less embedded in a cavity of the rhachis, the other pedicellate.

Spike densely silky-hairy. Outer glume of the sessile spikelet 2-lobed. Pedicellate spikelet barren 18. ELIONURUS.

Spike 1-sided, the rhachis scarcely articulate. Pedicellate spikelet barren 19. HEMARTHRIA.

Spike 1-sided. Outer glume of the sessile spikelet hard and globular. Pedicellate spikelet barren 20. MANISURIS.

Spike nearly cylindrical. No pedicellate spikelet 21. OPHIURUS.

Spike nearly cylindrical. Pedicellate spikelet barren or fertile 22. ROTTBOELLIA.

(See also some species of 25, *ISCHÆMUM*.)

SUBTRIBE III. **Mayadeæ**. Spikelets unisexual, the male usually paniculate, the females spicate at the base of the males or in a separate inflorescence.

Female spikelets below the males, the fruiting glume very hard, smooth and shining 23. CHIONACHNE.

(The cultivated Maize, *Zea Mays*, belongs to this subtribe.)

SUBTRIBE IV. **Euandropogoneæ**. Spikelets in pairs or threes rarely solitary, one sessile and fertile and one or two pedicellate and male neuter or rudimentary, rarely fertile or deficient. Flowering glume of the fertile spikelet usually awned or reduced to the awn.

(The awn is deficient in *Imperata*, in *Ischæmum pectinatum*, and sometimes minute or deficient in some varieties of other species.)

Spikelets in pairs along one side of a simple spike or of the spikelike branches of a simple panicle.

Spike single. Spikelets unisexual, the awned females turned to one side, the awnless males imbricate behind them 24. HETEROPOGON.

Spikes single or digitate. Sessile spikelet with a male flower below the fertile one 25. ISCHÆMUM.

- Spikes digitate. Spikelets 1-flowered, solitary in the notches 26. DIMERIA.
- Spikes digitate. Spikelets 1-flowered with a barren pedicel in the same notch. Awn dorsal near the apex 27. ARTHRAXON.
- Spikes digitate. Spikelets in pairs, both 1-flowered and usually fertile 28. POLLINIA.
- Spikes solitary digitate or several nearly sessile on a simple rhachis. Sessile spikelet 1-flowered and fertile, pedicellate one male or neuter 29. ANDROPOGON.
- Spikelets in single or few pairs or triplets on the slender branches of a more or less compound panicle.
- Panicle long and dense, usually cylindrical, the spikelets awnless, concealed under long silky hairs 30. IMPERATA.
- Panicle loose. Fertile spikelets awned.
- Outer glume either membranous or narrow and rigid with 2 prominent often mucronate lateral nerves 31. CHRYSOPOGON.
- Outer glume when in fruit hard, smooth and shining, ovate or lanceolate 32. SORGHUM.
- Spikelets in triplets (1 sessile and fertile between 2 pedicellate and male neuter or rudimentary) within sheathing bracts.
- Triplets surrounded by an involucre of 4 male or neuter spikelets at the base of the peduncle 33. ANTIHISTIRIA.
- Triplets sessile or pedunculate within the bract without any involucre 34. APLUDA.

SUBTRIBE V. Tristegineæ. *Spikelets paniculate, all similar, the terminal flowering glume more or less stiffened or enlarged when in fruit almost as in Panicæ, but the awn twisted and bent as in Andropogoneæ.*

- Glumes 4, 2 empty, the third with a male flower or empty. Panicle loose 35. ARUNDINELLA.
- Glumes 3, 2 empty. Panicle dense and spike-like 36. POLYPOGON.

TRIBE III. Olyreæ. *Spikelets 1-flowered, unisexual, the two sexes in the same panicle. Glumes 3, the flowering one large, membranous or hardened enclosing the grain. A palea to the flower. Stamens 6 (or in genera not Australian 3). Styles united at the base or high up. Stigmas feathery, 2 or 3.*

- Fruiting glume membranous, globular, with a small orifice. Stamens 6. Stigmas 3 37. LEPTASPIS.

B. Poaceæ. *Pedicels not articulate below the glumes. Rhachis of the spikelet articulate above the 2 or 3 lowest glumes, or wholly continuous. Spikelets with 1 or more fertile flowers, the males or imperfect ones if any above or very rarely below them. (In a few Phalaridæ the lower glumes deficient).*

TRIBE IV. Phalaridæ. *Spikelets with 1 terminal hermaphrodite flower and rarely 2 male flowers lower down. Glumes 2 to 6 all keeled or with a central nerve, 2 below the articulation of the rhachis persistent or in several genera deficient, 4 or fewer above the articulation, of which 2 enclose the grain without any distinctly 2-nerved palea.*

(In *Phalaris* itself the upper glume is apparently 2-nerved, the central nerve represented by a line of cilia.)

- Stamens 6, rarely 3. No glumes below the articulation.
- Spikelets very flat. Glumes 2 without any small ones 38. LEERSIA.
- Spikelets very flat. Glumes 4, the 2 outer very small 39. ORYZA.

- Spikelets not flattened. Glumes 4, membranous, the
2 outer very small 40. *POTAMOPHILA*.
Stamens 6 or 4, very rarely 3 or 2. 2 persistent glumes
below the articulation.
Stamens 6, rarely 3. Spikelets usually paniculate,
awned or unawned 41. *EHRIARTA*.
Stamens 4, rarely 2. Spikelets paniculate, more or
less awned 42. *MICROLENA*.
Stamens 4. Spikelets not awned 43. *TETRAHIENA*.
Stamens 3, rarely 2. Glumes 3, none below the articu-
lation.
Flowering glume awned. Panicle dense, cylindrical,
spikelike 44. *ALOPECURUS*.
Stamens 3, rarely 2; 2 persistent glumes below the
articulation, 2 inner ones enclosing the grain, 2
intermediate ones small or enclosing male flowers.
Panicle spikelike. Spikelets very flat. Intermediate
glumes small, unawned, empty or one deficient . . . 45. *PHALARIS*.
Panicle spikelike. Spikelets narrow. Intermediate
glumes small, empty, with a dorsal awn 46. *ANTHOXANTHUM*.
Panicle loose. Intermediate glumes enclosing male
flowers with 2-nerved palea 47. *HIEROCHLOE*.

TRIBE V. *Streptatheræ*.—Spikelets with 1, 2, or rarely several hermaphrodite flowers, and rarely a male flower above or below. Flowering glume usually bearing an awn twisted in the lower part, bent or divided about the middle. Palea 2-nerved, usually thin or small, in a few *Avenaceæ* as large as in *Festuceæ*.

(The awn is very small and straight or deficient in a few species of *Agrostis* and *Deyeuxia*, the twisted portion below the branches very short or obsolete in one section of *Aristida*.)

SUBTRIBE I. *Stipacæ*.—Spikelets 1-flowered. Awn terminal, simple or 3-branched. Lodicules 3. Fruiting glume usually narrow, hardened, enclosing the grain.

- Awn 3-branched 48. *ARISTIDA*.
Awn simple, at length articulate on the glume 49. *STIPA*.
Awn simple, continuous with the point of the glume . . . 50. *STREPTACHNE*.

SUBTRIBE II. *Agrostideæ*.—Spikelets 1-flowered. Awn either terminal between the lobes of the glume or dorsal, in a few species very small or deficient. Lodicules 2. Fruiting glume enclosing the grain, usually thin.

- Awn terminal between the lobes of the glume. Rhachis
of the spikelet not continued beyond the flower.
Lobes 2 on each side of the awn. Panicle branched . . . 51. *PENTAPOGON*.
Lobes 1 on each side of the reflexed awn. Spikelets
in an ovoid-globose head 52. *DIPLOPOGON*.
Awn more or less dorsal, sometimes minute or deficient.
No bristle continuing the rhachis beyond the rhachis.
Awn fine and near the tip of the glume. Palea
more than half as long as the glume 53. *DICHELACHNE*.
Awn dorsal or none. Palea not more than half
the glume or minute or none 54. *AGROSTIS*.
Rhachis of the spikelet usually produced into a point
or bristle beyond the flower or bearing an empty
glume. Awn various. Palea more than half as
long as the glume 55. *DEYEUXIA*.

SUBTRIBE III. *Avenaceæ*.—Spikelets with 2 or in a few genera more than 2 perfect flowers (only 1 in *Anisopogon*), the rhachis produced above them (except in *Aira*).

Awn either dorsal or terminal between the lobes of the glume. Grain enclosed in the glume and palea and sometimes adnate.

Awn dorsal.

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| Flowers both hermaphrodite, the rhachis not at all or scarcely produced. Grain adnate | 56. AIRA. |
| Lower flower hermaphrodite awnless, upper male shortly awned | 57. HOLCUS. |
| Lower flower male awned, upper flower hermaphrodite awnless. Grain free. Seed not furrowed | 58. ARRHENATHERUM. |
| Two perfect flowers. Flowering glumes keeled. Awns attached below the middle. Grain free | 59. DESCHAMPSIA. |
| Two or three perfect flowers. Flowering glumes keeled. Awns attached above the middle. Grain free, glabrous | 60. TRisetum. |
| Two or more perfect flowers. Flowering glume rounded on the back. Grain pubescent, frequently adnate. Seed deeply furrowed | 61. AVENA. |
| Several (5 or more) perfect flowers. Flowering glumes rounded on the back. Grain glabrous. Seed deeply furrowed | 62. AMPHIBROMUS. |
| Awn terminal between the rigid lobes or lateral awns of the glume. | |
| Spikelets (large with long awns) 1-flowered | 63. ANISOPOGON. |
| Spikelets several-flowered | 64. DANTHONIA. |

TRIBE VI. *Astrepæ*.—*Spikelets with several or in a few genera only 1 or 2 hermaphrodite flowers, the rhachis usually produced and often bearing 1 or more empty glumes above them. Flowering glume unawned or with 1 or more terminal untwisted awns. Palea prominently 2-nerved or 2-keeled, usually as long or nearly as long as the glume.*

(The rhachis is not produced above the perfect flowers in *Miliæ* and in a few species of other subtribes.)

SUBTRIBE I.—*Pappophoræ*.—*Spikelets 1- or several-flowered, in a dense compound head or in a spikelike or looser panicle. Flowering glumes rounded on the back, with 3 or more nerves leading to 3 or more terminal lobes or teeth all unawned or the central one or all tapering into untwisted awns.*

(See also 73, *CHLORIS*, which has often a small awn or narrow lobe on each side of the awn, and a few *Festucæ* have the hyaline tip 2-lobed in front of or on the sides of the awn.)

Spikelets 1-flowered, capitate.

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| Rhachis not produced above the flower. Lobes of the flowering glume 3, all with long points or fine awns | 65. AMPHIPOGON. |
| Rhachis continued in a small bristle. Lobes of the flowering glume 3, the central one alone awned | 66. ECHINOPOGON. |
| Spikelets with 1 perfect flower and 1 or more males or empty glumes in a short dense or loose panicle. Flowering glume with 9 or in extra Australian species more plumose awns | 67. PAPPOPHORUM. |
| Spikelets several-flowered, sessile in 2 rows on one side of 1 or 2 simple spikes. Lobes of the flowering glume 3, the central one alone awned | 68. ASTREBLA. |
| Spikelets several-flowered, paniculate. | |
| Flowering glume with 3 narrow awned lobes | 69. TRIRAPHIS. |
| Flowering glume with 3 unawned lobes or teeth | 70. TRIODIA. |

SUBTRIBE II. Chlorideæ.—*Spikelets 1- or several-flowered, sessile in simple second or unilateral spikes, which are either solitary or digitate or scattered on a common rhachis. Flowering glumes usually keeled, entire and unawned, or with 1, rarely 3, untwisted awns.*

(68. *ASTREBLA* has the inflorescence but not the glumes of Chlorideæ.)

- Spikelets 1-flowered, awnless, in a simple slender spike, the rhachis of the spikelet not produced above the flower 71. *MICROCHLOA*.
- Spikelets 1-flowered, awnless, in digitate spikes, the rhachis of the spikelet not at all or minutely produced above the flower 72. *CYNODON*.
- Spikelets 1-flowered, awned, in a simple or in digitate spikes, with one or more empty glumes above the flowering one 73. *CHLORIS*.
- Spikelets several-flowered, awnless or with long-pointed glumes, in digitate or scattered spikes. Grain or seed within the pericarp loose and rugose 74. *ELEUSINE*.
- Spikelets several- or rarely 1-flowered, awnless, in scattered spikes. Grain smooth, the pericarp adnate 75. *LEPTOCHLOA*.
- Spikelets several-flowered, awnless in a single or in scattered spikes. Flowering glumes with a minute point between 2 small hyaline lobes 76. *DIPLACHNE*.

SUBTRIBE III. Milieæ.—*Spikelets 1- or 2-flowered in a loose or narrow and dense panicle, the rhachis of the spikelet not produced above the upper flower. Outer glumes usually convex, several-nerved or almost nerveless, unawned. Flowering glumes nearly similar, unawned or with one straight awn. Grain free.*

- Rhachis of the spikelet glabrous or nearly so. Outer glumes faintly nerved. Flowering glumes unawned.
- Spikelets 1-flowered 77. *SPOROBOLUS*.
- Spikelets 2-flowered.
- Flowering glumes close together, not hardened round the grain 78. *MICRAIRA*.
- Flowering glumes close together or little distant, hardened as well as the palea round the grain as in *Panicum* 79. *ISACHNE*.
- Upper flowering glume raised considerably above the lower, not hardened round the grain 80. *COELACHNE*.
- Rhachis of the spikelet hairy round the flowering glumes.
- Spikelets 2-flowered. Outer glumes many-nerved.
- Flowering glumes awned or unawned 81. *ERLACHNE*.

SUBTRIBE IV. Festucaceæ.—*Spikelets several- often many-flowered in a loose or narrow and dense panicle or capitate, the rhachis of the spikelet usually produced beyond the last flower or ending in an empty glume. Outer glumes usually narrow, acute or rarely obtuse, unawned. Flowering glumes entire or slightly notched, obtuse, acute or the keel or midrib produced into a point or straight awn.*

* Empty glumes several, either above 1 or 2 flowering ones or in a separate spikelet.

- Several empty awned glumes above 1 or 2 flowering ones. Panicle narrow and dense or loose and spreading 82. *ECTROSLA*.

- Many empty glumes above 1 flowering one, all un-
awned. Panicle contracted into a dense sessile
head or interrupted spike 83. HETERACHNE.
Many empty unawned glumes in a separate spikelet
from the fertile one. Panicle dense, unilateral 84. LAMARCKIA.

*** Only 1 empty glume above the flowering ones, sometimes rudimentary or deficient.*

- Rhachis of the spikelet with long hairs enveloping the
flowering glumes. Lowest flower male. Panicle
large and loose 85. PHRAGMITES.
Rhachis of the spikelet glabrous. Spikelets dicecious,
few with closely imbricate glumes. Pericarp
thick and spongy 86. DISTICHLIS.
Rhachis of the spikelet glabrous or shortly or loosely
hairy. Spikelets hermaphrodite.
Grain free from the palea (except in a few *Poa*).
Spikelets usually flat, the flowering glumes keeled,
entire.
Flowering glume and palea thinly scarious or
hyaline, the glume acute or shortly
awned.
Spikelets in globular clusters in a long in-
terrupted spike. Palea-keels broadly
winged 87. ELYTROPHORUS
Panicle dense and spike-like. Palea not
winged 88. KÜLERIA.
Flowering glumes membranous or herbaceous,
3- or 5-nerved.
Spikelets few-flowered, sessile in dense one-
sided clusters in a dense one-sided
panicle 89. DACTYLIS.
Spikelets few-flowered in a large loose panicle.
Upper glumes bearing reflexed bristles 90. CENTOTHECA.
Spikelets usually many-flowered. Flowering
glumes 3-nerved 91. ERAGROSTIS.
Spikelets few-flowered. Flowering glumes
5-nerved 92. POA.
Spikelets flattened. Flowering glumes with hya-
line tips, notched or 2-lobed, the keel forming
a small point between the lobes or just below
them 93. SCHEDONORUS.
Spikelets narrow. Flowering glumes rounded on
the back with 3 or more nerves not reaching
to the obtuse hyaline apex 94. GLYCERIA.
Spikelets broad. Flowering glumes very broad
thin and concave almost vesicular 95. BRIZA.
Grain adnate to the palea when ripe.
Ovary pubescent, obtuse. Flowering glumes with
a dorsal point or awn below the entire or
notched hyaline tip 96. BROMUS.
Ovary pubescent, 3-horned. Spikelets very flat.
Flowering glumes entire, acute 97. CERATOCHELOA.
Ovary glabrous. Spikelets usually narrow.
Flowering glumes entire, acute or awned 98. FESTUCA.

SUBTRIBE V. Hordeaceæ.—*Spikelets 1- or several-flowered, sessile on the opposite sides or alternate notches of the rhachis of a simple spike. Glumes entire, awned or unawned.*

- Spikelets several-flowered, flat, one side or face of the spikelet next to the continuous scarcely notched rhachis 99. *AGROPYRUM*.
 Spikelets several-flowered, flat, one edge of the spikelet next to the continuous notched rhachis 100. *LOLIUM*.
 Spikelets 1- or 2-flowered, with the rhachis produced above the flower, half embedded in the notches of the more or less articulate rhachis 101. *LEPTURUS*.
 Spikelets 1-flowered, hermaphrodite male or neuter, 3 together in the notches of the rhachis of a dense cylindrical spike 102. *HORDEUM*.

Of the conspicuous tribe **Bambusaceæ**, so generally spread over the tropical regions of the New as well as the Old World, no representative has as yet been detected in Australia.

TRIBE I. PANICEÆ. Fertile spikelets with a terminal hermaphrodite or female flower, with or without a male one below it, the pedicel usually articulate immediately under the outer glume. Glumes 4 or 3, the upper flowering one of a firmer texture, the outer empty one usually small, sometimes wanting. A palea to each flower. Lodicules usually rather thick, sometimes minute or wanting. Stamens 3, rarely fewer. Styles free or united at the base, sometimes rather long, with feathery stigmas. Grain enclosed in the hardened or stiffened upper glume and palea, but free from them. Awns rare and when present neither twisted nor bent back.

Paniceæ agree with Andropogoneæ in the articulation of the rhachis of the spikelet being below and usually immediately under the lowest or outer glume, differing chiefly in the relative consistency and development of the innermost and outermost glumes, as well as in the twisted and bent awns frequent (though not constant) in Andropogoneæ, but never present in Paniceæ. The only slightly exceptional genera in Paniceæ are *Chamæraphis* and *Stenotaphrum*, where the fruiting glume and palea are scarcely hardened though not so reduced or hyaline as in Andropogoneæ, and *Cenchrus* and some other involucrate genera, where the articulation is below the involucre.

1. *PASPALUM*, Linn.

Spikelets 1-flowered, not awned, not callous at the base, in 1 or 2 rows along one side of slender spikes, either forming the branches of a simple panicle, or rarely solitary. Glumes 3, 2 outer ones empty, usually membranous and equal or nearly so, the 3rd flowering of a firmer texture. Palea within the flowering glume smaller and more involute. Styles distinct, rather long. Grain enclosed in the hardened palea and flowering glume, and free from them.

A large tropical and subtropical genus, especially abundant in America, where it is also extratropical. The Australian species are all common in the tropical regions of the Old World, and one is also in America.

- Spikes 2 to 5, usually distant. Spikelets orbicular or broadly ovate, obtuse, about 1 line long 1. *P. scrobiculatum*.
 Spikes 2, close together or scarcely distant. Spikelets ovate-oblong, acute or acuminate, $1\frac{1}{2}$ to 2 lines long 2. *P. distichum*.
 Spikes 2 or 3, digitate or nearly so. Spikelets ovate, about $\frac{3}{4}$ line long 3. *P. brevifolium*.
 Spikes rather numerous, filiform. Spikelets narrow-ovate, about $\frac{3}{4}$ line long 4. *P. minutiflorum*.

(See also *Panicum gibbosum*, in which the outer glume is deficient.)

P. Sieberianum, Steud. Syn. Glum. i. 17, is the common American *P. conjugatum*, Berg., published as Australian on the authority of the specimens of Sieber's *Agrostotheca*, n. 127, which are however West Indian.

1. ***P. scrobiculatum*, Linn.; Kunth, Enum. i. 53.**—Erect or ascending, attaining 1 to 2 ft., the Australian specimens glabrous or rarely with a few long hairs at the base of the leaf-blades. Spikes varying from 2 to 5, alternate, spreading, usually distant, 1 to 2 or rarely nearly 3 in. long, the rachis usually flat and about 1 line broad, and sometimes minutely pubescent at the base. Spikelets sessile or shortly pedicellate in 2 close rows or rarely in part at least of the spike crowded into 3 or 4 rows, ovoid-orbicular, obtuse, flat, about 1 line long when in fruit. Outer empty glumes thinly membranous, with a prominent midrib, sometimes minutely pubescent. Fruiting glume similar in shape but soon hardened, very finely striate, the central nerve visible only in the young state. Palea hardened like the flowering glume, the inflected margins dilated at the base into broad hyaline auricles enveloping the flower.—Trin. Spec. Gram. ii. t. 143; F. Muell. Fragm. viii. 156; *P. orbiculare*, Forst.; R. Br. Prod. 188; *P. polystachyum*, and *P. pubescens*, R. Br. l. c.; *P. metabolon*, Steud. Syn. Glum. i. 19.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; M'Adam Range and Roper River, *F. Mueller*; between Norman and Gilbert Rivers, *Gulliver*; Sweers Island, *Henne*; Escape Cliffs, *Hulse*; Sims Island, *A. Cunningham*.

Queensland. Northumberland Islands, *R. Brown*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*; Percy Island and Port Curtis, *M'Gillivray*; Brisbane River, *F. Mueller*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolfs*; Hastings and Macleay Rivers, *Beckler*; Clarence River, *Wilcox*.

Frequent in tropical and subtropical Asia and Africa. All or nearly all the Australian specimens belong to the variety still distinguished by some as a species under Forster's name *orbiculare*, usually a more slender plant with smaller spikelets, the rachis often pubescent at the base, and the outer glumes scarcely or not at all scrobiculate. The marginal indentures and the intermediate nerves between the midrib and the marginal ones of the typical *P. scrobiculatum* are chiefly prominent in cultivated varieties.

2. ***P. distichum*, Linn.; Kunth, Enum. i. 52.**—Stems often creeping and rooting in the sands to a great extent, the ascending extremities varying from short and entirely covered with the leaf-sheaths, to slender 1 ft. long or more with the leaves distant. Leaves either

linear-lanceolate and flat or involute and almost subulate, glabrous or with a few long hairs at the orifice of the sheath and base of the lamina. Spikes 2, close together or the lowest at a distance of 1 to 2 lines, quite glabrous, the rhachis not above $\frac{1}{2}$ line broad. Spikelets sessile in 2 rows, oval-oblong, acute or acuminate, flat, $1\frac{1}{2}$ to nearly 2 lines long. Outer empty glumes equal and distinctly 3-nerved. Fruiting glume hardened and very faintly 3-nerved or the central nerve alone perceptible.—F. Muell. Fragm. viii. 156; *P. littorale*, R. Br. Prod. 188; Trin. Spec. Gram. i. t. 112.

Queensland. Rockhampton, *O'Shanesy*; Condamine River, *Hartman*.

N. S. Wales. Port Jackson, *R. Brown*, *Woolfs*, *C. Moore*; Richmond River, *Danger*, *Mrs. Hodgkinson*.

Victoria. Yarra-Yarra, *F. Mueller*.

W. Australia. Murchison River, *Oldfield*.

Widely distributed over the tropical regions of both the New and the Old World.

3. *P. brevifolium*, *Flügge*; *Kunth*, *Enum.* i. 48.—Stems from a creeping or much-branched base erect, slender, 1 ft. high or rather more. Leaves short, narrow, flat, the sheaths usually villous or pubescent, the ligula scarious, jagged. Spikes or panicle-branches 2 or rarely 3, digitate at the end of the peduncle, filiform, 1 to 2 in. long. Spikelets scattered along one side of the rhachis, on short curved pedicels, ovate, rather obtuse or almost acute, about $\frac{3}{4}$ line long, sprinkled with short fine appressed silky hairs. Empty glumes 2, rather obtuse, nearly equal, thin, finely 5-nerved.—*Panicum tenuiflorum*, R. Br. Prod. 193.

Queensland. Keppel Bay, *R. Brown*; Brisbane River, Moreton Bay, *F. Mueller*, *Bailey*; Rockhampton, *O'Shanesy*; Herbert's Creek, *Bowman*; Archer's Flat, *Leichhardt*; Rockingham Bay, *Dallachy*.

N. S. Wales. Port Jackson, *R. Brown*.

Var. *propinquum*. Rather taller. Leaves rather longer. Spikes 2 to 3 in. long.—*Panicum propinquum*, R. Br. Prod. 193.

N. Australia. Gulf of Carpentaria, *R. Brown*; between M'Adam Range and Providence Hill, *F. Mueller*.

The species is widely spread over tropical Asia.

4. *P. minutiflorum*, *Steud. Syn. Glum.* i. 17.—A rather tall glabrous grass, closely resembling at first sight the *Panicum parviflorum*, Br., but with the characters of *Paspalum*, and nearly allied to *P. brevifolium*. Leaves flat, rather long and narrow, the ligula short, not ciliate. Spikes or panicle-branches rather numerous, filiform, alternate or the upper ones clustered, 3 to 5 in. long. Spikelets numerous, very shortly but unequally pedicellate, narrow-ovate, rather acute, about $\frac{3}{4}$ line long. Empty glumes 2, nearly equal, prominently 3-nerved, glabrous or the margins minutely ciliate. Fruiting glume acute, smooth and shining.

Queensland. Port Curtis, *McGillivray*.

Widely spread over tropical Asia. Munro informs me that the *P. Chinense*, Nees in Steud. Syn. Glum. i. 41, referred in Fl. Hongk. to *P. brevifolium*, belongs rather to *P. minutiflorum*.

2. *ERIOCHLOA*, Humb. and Kunth.

(*Helopus*, *Trin.*)

Spikelets 1-flowered, without protruding awns, with a callous annular or almost cuplike base, articulate on a short pedicel, in 1 or 2 rows along one side of the slender branches of a simple panicle. Glumes 3, 2 outer ones empty, usually membranous, equal or nearly so, the 3rd or flowering glume shorter, of a firm coriaceous texture, obtuse but tipped with a point or short awn not exceeding the outer glumes. Palea within the flowering glume coriaceous and involute. Styles distinct, rather long. Grain enclosed in the hardened palea and flowering glume and free from them.

A small tropical genus, common to the New and the Old World. The Australian species have both a wide range, at least in tropical Asia.

Spikelets usually above $1\frac{1}{2}$ lines long, the rhachis of the spikes and main axis of the panicle pubescent or hirsute

1. *E. punctata*.

Spikelets usually under $1\frac{1}{2}$ lines long, the rhachis and main axis glabrous

2. *E. annulata*.

1. *E. punctata*, *Hamilt.*; *Kunth*, *Enum.* i. 72.—An erect grass attaining 2 or 3 ft., glabrous except the inflorescence and sometimes a slight pubescence in the upper part. Leaves rather long, flat or convolute when dry. Spikes or panicle-branches about 5 to 8, distant, erect, secund, the lowest often above 2 in. long, the others gradually shorter, the rhachis as well as the main axis pubescent or hairy. Spikelets all pedicellate, but often rather close, the pedicels 1 to 2 lines long, usually bearing a few long hairs, the spikelet ovoid, acute or shortly acuminate, rather above $1\frac{1}{2}$ lines long, seated on a thick annular or almost cupular disk articulate on the pedicel. Empty glumes membranous, broad and usually 5-nerved, or the inner one rather narrower and sometimes only 3-nerved, both more or less hairy outside and sometimes rather densely covered with long hairs. Flowering glume much shorter, coriaceous, faintly 3- or 5-nerved, obtuse, but the midrib produced into a point or awn as long as the outer glumes as in *Panicum helopus*.—*Milium punctatum*, *Linn.*; *R. Br. Prod.* 188; *Paspalum punctatum*, *Flügge*; *Trin. Spec. Gram.* t. 155.

N. Australia. Near Providence Hill, *F. Mueller*.

Queensland. Shoalwater Bay, Keppel Bay, Broad Sound, *R. Brown*; Brisbane River, Moreton Bay, *F. Mueller*, *Prentice*; Springsure, *Wuth.*

N. S. Wales. Bogan River, *Mitchell*.





2. **E. annulata**, Kunth, *Enum.* i. 73.—A smaller and more slender grass than *E. punctata*, the leaves usually narrower, glabrous. Spikes slender, 1 to $1\frac{1}{2}$ in. long, the main axis of the inflorescence as well as the rhachis usually glabrous, the pedicels sometimes bearing a few short hairs. Spikelets narrow, tapering at the end, scarcely $1\frac{1}{2}$ lines long, including the point, which is rather longer than in *E. punctata*. Empty glumes much less hairy than in that species, 3- or rarely 5-nerved. Flowering glume the same.—*Paspalum annulatum*, Flüggé; Trin. Spec. Gram. t. 133.

Queensland. Brisbane River, F. Mueller, Prentice; Rockhampton, Thozet, Bowman; Darling Downs, Law.

Var. *acrotricha*. Spikelets rather longer, with long points and rather more hairy, and the hairs of the pedicels more numerous, with a few sometimes also on the rhachis.—*Helopus acrotrichus*, Steud. Syn. Glum. i. 100.

N. S. Wales. Camden County and Castlereagh, Woolls; Maneroa, Mrs. Calvert; also in Leichhardt's collection.

The species is by some regarded as a variety of *E. punctata*.

3. PANICUM, Linn.

(Digitaria, Scop.; Echinochloa, Beauv.; Coridochloa, Nees.)

Spikelets with 1 terminal hermaphrodite flower and occasionally a male or rudimentary flower below it, rarely awned, variously arranged along the branches of a simple or compound panicle rarely reduced to a simple spike, the partial rhachis very rarely produced beyond the last spikelet; barren awnlike branches none, or very rarely a single one. Glumes usually 4, the outer one smaller than the others, not awned, often very small, deficient only in *P. gibbosum*, the 2nd and 3rd very variable in relative proportions, the 3rd occasionally with a palea with or without 3 stamens in its axil; 4th or fruiting glume smaller or as long as the 3rd, of a firmer consistence, enclosing a palea and hermaphrodite flower. Styles distinct or very shortly united at the base. Grain enclosed in the hardened fruiting glume and palea, but free from them.

One of the largest genera of Gramineæ, abundantly represented in all tropical countries, a few species extending beyond the tropics in the Old World, and a somewhat larger number in North America. Of the 53 Australian species, 3 are common weeds of warm countries, 13 are more or less generally spread over tropical Asia, most of them extending into Africa, and a few of them found also in America, 2 have as yet been identified only with tropical American species, and 35 are as far as known endemic, although 3 or 4 of them are closely allied to American species. Three species are also recorded as escapes from cultivation.

The great differences in inflorescence, a character admitted as generic in most Gramineæ, has induced the division of *Panicum* into several genera more or less adopted by Nees, Kunth and others, but there are so many intermediate species connecting the different groups or series that I have not succeeded in giving characters positive enough to define them even as sections.

SERIES I. Digitariæ. *Spikelets mostly in pairs along the outer or lower side of the simple slender branches of the panicle, one of each pair always pedicellate, the other sessile or on a shorter pedicel, the upper ones of each branch occasionally solitary, the lower ones very rarely clustered. Outer glume usually very small.*

Branches of the panicle often numerous, the lower ones long and verticillate, the upper ones scattered.

Lowest spikelet of each pair sessile.

Spikelets $1\frac{1}{2}$ to 2 lines long, more or less silky hairy

Spikelets 1 to $1\frac{1}{2}$ lines long, more or less silky hairy

Spikelets 1 to $1\frac{1}{2}$ lines long, not silky, but the lateral nerves of the third glume ciliate with rigid hairs seated on tubercles

Both spikelets of each pair on long capillary pedicels, one pedicel much longer than the other. Spikelets under 1 line long, glabrous or silky hairy

Branches of the panicle few, digitate or clustered at the end of the peduncle.

Branches 3 to 8. Spikelets of each pair similar, both fertile, glabrous or softly ciliate

Branches usually 2. Spikelets of each pair dissimilar, the upper one fertile, ciliate, with rigid hairs seated on tubercles on the lateral nerves of the 3rd glume, the lower one usually with a male flower only and not rigidly ciliate

Branches of the panicle scattered or the upper ones approximate, the lower ones rarely clustered and not verticillate.

Branches usually 2, distant, 1 to $1\frac{1}{2}$ in. long. Spikelets narrow, about 1 line long

Branches usually 3, distant, 1 to $1\frac{1}{2}$ in. long. Spikelets ovoid, about $\frac{1}{2}$ line long

Branches often numerous, 2 to 6 in. long. Spikelets glabrous, $\frac{1}{2}$ to $\frac{3}{4}$ line long, the lower ones often clustered

Branches often numerous, 2 to 6 in. long. Spikelets narrow, nearly 1 line long, silky hairy

(The spikelets are usually in pairs also in *P. prostratum*, and occasionally in some others).

SERIES II. Trichachnæ. *Spikelets silky hairy, or fringed with long hairs, sessile or shortly pedicellate, clustered or rarely in pairs along the rachis of the simple spike-like panicle or of the 2 or few long erect branches.*

Spike single. Spikelets mostly in pairs, about 1 line long, silky hairy, the outer glume deficient

Spike-like branches few or spike single. Spikelets mostly clustered, 1 to $1\frac{1}{2}$ lines long, the outer glume present but small and often concealed by the long silky hairs

Spike-like branches few. Spikelets 2 to $2\frac{1}{2}$ lines long, fringed with long hairs connected by a prominent nerve or membrane. Glumes with fine points

SERIES III. Paspaloideæ. *Spikelets sessile or very shortly pedicellate, in 1 or 2 rows, very rarely in pairs, along the short simple alternate often distant spikes or spike-like branches of the panicle, rarely reduced to a single terminal spike.*

Spikes erect, distant or single. Spikelets usually sessile.

Spike single, terminal. Spikelets glabrous, singly distant or the lowest in pairs.

1. *P. canicolum.*

2. *P. divaricatissimum.*

3. *P. macractinium.*

4. *P. papposum.*

5. *P. sanguinale.*

6. *P. ctenanthum.*

7. *P. stenostachyum.*

8. *P. tenuissimum.*

9. *P. parviflorum.*

10. *P. Baileyi.*

11. *P. gibbosum.*

12. *P. leucophæum.*

13. *P. semialatum.*

- Fruiting glume glabrous, rugose 14. *P. rarum*.
 Fruiting glume densely and softly pubescent 44. *P. marginatum*.
 Spikes several, distant. Spikelets with long silvery-silky hairs.
 Spikelets truncate, singly distant 15. *P. argenteum*.
 Spikelets ovoid, often approximate 16. *P. holosericeum*.
 Spikes several, distant. Spikelets glabrous, in 2 close rows.
 Spikelets oblique, 1 to $1\frac{1}{2}$ lines long in 2 close regular rows, 2nd glume broad gibbous, 3rd glume flatter, with a palea in its axil 17. *P. flavidum*.
 Spikelets nearly straight, 1 to $1\frac{1}{2}$ lines long, the rows not always regular and sometimes very few in the spike, 2nd and 3rd glumes nearly equal, both empty 18. *P. gracile*.
 Spikelets straight, very obtuse, $1\frac{1}{2}$ to 2 lines long, the rows irregular. Outer glume nearly as long as the others. A male flower in the 3rd glume * *P. obtusum*.
 Spikes usually approximate, erect or at length spreading. Spikelets not so closely sessile and frequently subtended by hairs or bristles.
 Spikelets about 1 line long, frequently in pairs. A palea in the 3rd glume. Fruiting glume obtuse, rarely tipped with a minute point 19. *P. prostratum*.
 Spikelets nearly 2 lines long, in 2 rows. A broad palea in the 3rd glume. Fruiting glume obtuse, with an awn-like point 20. *P. helopus*.
 Spikelets nearly 2 lines long, in 2 rows. A broad palea in the 3rd glume, which is ciliate with long hairs. Fruiting glume obtuse with a short point 21. *P. Gilesii*.
 Spikelets nearly 2 lines long, in 2 rows. 3rd glume empty. Fruiting glume obtuse without any point. Leaves hairy 22. *P. piligerum*.
 (See also the first four species of the *Paniculatae*).
 Spikes distant, at length spreading or reflexed. Spikelets alternate along the rhachis but not close and appearing almost uniseriate.
 Leaves pubescent. Spikelets distant on a slender rhachis 23. *P. polyphyllum*.
 Leaves glabrous. Spikelets near together on a flattened rhachis 24. *P. distachyum*.
 Leaves glabrous. Spikes reflexed, the rhachis flattened, ending in an awn-like point, and a rigid awn-like bristle under the lowest spikelet 25. *P. reversum*.

SERIES IV. *Echinochloæ*. Spikelets sessile and crowded in 3 or 4 rows or irregularly along the simple alternate usually secund spikes or spike-like branches of the panicle. Glumes sometimes awned.

- Spikelets about 1 line long, never awned, densely crowded in 4 rows along the rhachis, without hairs or bristles 26. *P. colonum*.
 Spikelets $1\frac{1}{2}$ to 2 lines long, acuminate or awned, crowded and clustered along the rhachis, usually intermixed with rigid hairs or bristles 27. *P. crus-galli*.

SERIES V. *Myuroideæ*. Spikelets not silky, crowded and clustered in a dense continuous or rarely interrupted cylindrical spike-like panicle.

- Spikelets ovoid, obtuse, $\frac{1}{2}$ to $\frac{3}{4}$ line long 28. *P. myosuroides*.

- Spikelets acuminate, curved, 1 to $1\frac{1}{2}$ lines long or rather more 29. *P. indicum*.
 Spikelets acuminate, 2 to 3 lines long. Fruiting glume thin 30. *P. myurus*.

SERIES VI. **Paniculatæ.** *Panicle-branches usually more or less divided. Spikelets all pedicellate (except sometimes the first four species).*

- Panicle-branches scarcely divided. Spikelets few, rarely more numerous, scarcely under 2 lines long. No male flowers.
 Spikelets nearly or sometimes quite sessile. (Species approaching the *Paspaloideæ*.)
 Spikelets 2 to $2\frac{1}{2}$ lines long, mostly distant along the branches 31. *P. foliosum*.
 Spikelets rather under 2 lines, crowded on the lower part of the branches in a compact panicle, 2nd and 3rd glumes almost equal 32. *P. adpersum*.
 Spikelets $1\frac{1}{2}$ lines long, rather crowded on the distant branches of a long and narrow panicle. Outer glume $\frac{1}{2}$, 2nd $\frac{1}{2}$ as long as the 3rd 33. *P. inæquale*.
 Spikelets few, distinctly pedicellate, in a loose spreading panicle.
 Spikelets $2\frac{1}{2}$ to 3 lines long, sprinkled with hooked hairs. Fruiting glume close above the others 34. *P. uncinatum*.
 Spikelets 3 lines long, glabrous. Fruiting glume raised above the others on a stipes dilated at the top. Panicle pedunculate 35. *P. majusculum*.
 Spikelets 2 lines long, glabrous. Fruiting glume raised above the others. Panicle scarcely exceeding the floral leaves 36. *P. pauciflorum*.
 Panicle narrow or spreading. Spikelets numerous, 1 to near 2 lines long. A male flower in the 3rd glume. Spikelets crowded on the smaller branches. Glumes acute or acuminate; nerves of the 2nd very prominent and rigidly ciliate 37. *P. semitonsum*.
 Spikelets crowded or clustered on the smaller branches. Glumes acute or acuminate, not ciliate 38. *P. antidotale*.
 Spikelets often numerous, shortly pedicellate, not clustered. Glumes acute or acuminate 39. *P. repens*.
 Spikelets numerous, on rather long pedicels. Glumes acute 40. *P. capillipes*.
 Panicle large. Spikelets obtuse, $1\frac{1}{2}$ lines long. Fruiting glume rugose * *P. maximum*.
 Spikelets $\frac{1}{2}$ to $\frac{3}{4}$ line long. No male flower.
 Diffuse or creeping. Panicle-branches few, spreading. Spikelets few and distant, $\frac{3}{4}$ line long, on short pedicels 41. *P. pygmaeum*.
 Erect. Panicle-branches numerous, capillary. Spikelets $\frac{1}{2}$ line long, on capillary pedicels 42. *P. trichoides*.
 Ascending or erect. Panicle narrow, rather dense. Spikelets very numerous, $\frac{3}{4}$ line long. Fruiting glume very gibbous 43. *P. hermaphroditum*.
 Spikelets usually numerous, 1 to near 2 lines long, pedicellate. No male flower.
 Panicle narrow, branches usually few.
 Fruiting glume densely pubescent 44. *P. marginatum*.
 Fruiting glume smooth and shining.

- Panicle 1 to 2 in. long. Outer glume ovate, acute. Leaves pubescent 45. *P. lachnophyllum*.
- Panicle 1 to 2 in. long. Spikelets about 1 line. Outer glume ovate, acute. Leaves glabrous 46. *P. obseptum*.
- Panicle 3 to 4 in. long. Spikelets nearly 2 lines. Outer glume short, broad, truncate. Leaves glabrous 47. *P. Busei*.
- Panicle spreading with numerous capillary branches. Panicle-branches scattered, neither clustered nor verticillate.
- Spikelets 1 line long, acute. Outer glume acute. A palea in the 3rd glume 48. *P. bicolor*.
- Spikelets 1 line long, rather obtuse. Outer glume acute. No palea in the 3rd glume 49. *P. melananthum*.
- Lower panicle-branches clustered but scarcely verticillate.
- Spikelets about 1 line. Outer glume acute, half as long as the spikelet. A palea in the 3d glume. Nodes prominently ciliate. Ligula a ring of long cilia 50. *P. effusum*.
- Spikelets of *P. effusum*. Nodes glabrous. Ligula very short 51. *P. Mitchelli*.
- Spikelets about 1 line. Outer glume short, broad, truncate or scarcely acute, nerveless. A palea in the 3rd glume 52. *P. decompositum*.
- Spikelets nearly 2 lines. Outer glume acute. A palea in the 3rd glume. Panicle large. Leaves hairy * *P. miliacum*.
- Lower panicle-branches verticillate. Outer glume nearly as long as the others. A palea in the 3rd glume.
- Ligula very short, with a ring of cilia 53. *P. trachyrhachis*.
- Ligula prominent, scarios, without cilia 54. *P. prolatum*.

SERIES I. DIGITARIEÆ.—Spikelets usually small, mostly in pairs along the outer or lower side of the simple slender branches of the panicle, one of each pair always pedicellate, the other sessile or on a shorter pedicel, the upper ones of each branch occasionally solitary, the lower ones very rarely clustered. Outer glume usually very small.

1. *P. cœnicolum*, *F. Muell. in Trans. Vict. Inst.* 1855, 45.—Stems from a knotty branching base ascending to 1 ft. or more. Leaves flat, usually softly pubescent or villous. Panicle of rather numerous slender simple branches, 3 to 4 in. long, at first erect, at length spreading, the lower ones verticillate, the upper ones alternate and distant or rarely in pairs. Spikelets in pairs, 1 sessile, the other pedicellate, oblong, $1\frac{1}{2}$ to 2 lines long. Outer glume not exceeding $\frac{1}{2}$ line in our specimens, the 2nd rather shorter than the spikelet, 5- or 7-nerved, the 3d 7- to 11-nerved, both more or less silky-hairy and empty. Fruiting glume smooth, acute.

S. Australia. Cudnaka, *F. Mueller*; near Lake Eyre, *Andreus*.

W. Australia. Fraser's Range, *Dempster*.

2. *P. divaricatissimum*, *R. Br. Prod.* 192.—Stems from a
2 H 2

branching base sometimes under, sometimes much above 1 ft. high. Leaves glabrous or more or less pubescent or softly villous, the ligula not prominent and not ciliate. Panicle of rather numerous rigidly filiform simple branches 3 to 8 in. long, at first erect, at length spreading, the lower ones in a dense verticil, the upper ones alternate and distant. Spikelets in pairs or rarely solitary along the branches, one sessile the other pedicellate, 1 to $1\frac{1}{2}$ lines long, glabrous or covered with long silky hairs spreading when in fruit. Outer glume very small, ovate, obtuse, the 2nd and 3rd nearly equal and both empty or the 3rd rarely with a minute rudimentary palea, the 2nd usually 3-nerved, the 3rd 5-nerved. Fruiting glume ovoid, not gibbous, glabrous, smooth, acute.

There appear to be four rather marked varieties; but scarcely definite enough to be regarded as distinct species.

1. *glaberrimum*. Stems tall, branches of the panicle sometimes more than 8 in. long, the whole plant glabrous. Spikelets $1\frac{1}{2}$ lines long, glabrous.

Queensland. Rockhampton and neighbourhood, *Thozet*, *O'Shanesy*; Peak Downs, *Burkitt*; Darling Downs, *Law*.

2. *normale*. Foliage glabrous or nearly so. Panicle-branches 4 to 8 in. long. Spikelets $1\frac{1}{2}$ lines long, silky-villous, rarely nearly glabrous.

Queensland. Keppel Bay, *R. Brown*.

N. S. Wales. Port Jackson, *R. Brown*.

3. *ammophilum*. Foliage softly villous. Spikelets small, covered with long silky hairs spreading when in fruit.—*P. ammophilum*, *F. Muell.* in *Trans. Vict. Inst.* 1855, 46.

N. S. Wales. Murray and Murrumbidgee Rivers, *F. Mueller*, thence to Mount Goningberi, *Victorian Expedition*.

S. Australia. Lake Amadeus, *Giles*.

4. *radiatum*. Foliage softly villous. Spikelets small, glabrous or nearly so.—*P. radiatum*, *R. Br. Prod.* 192.

Queensland. Ballandool, *Lockyer*; Armadillo, *Barton*.

N. S. Wales. Port Jackson, *R. Brown*.

3. *P. macractinium*, *Benth.*—Allied to *P. divaricatissimum*, but taller and quite glabrous. Panicle similar, the slender branches rigid, often 6 to 8 in. long, the lower ones in a dense verticil, the upper ones alternate and distant. Spikelets distant in pairs, one almost sessile, the other on a longer pedicel, both fertile and similar, narrow, acute, about $1\frac{1}{2}$ lines long. Outer glume $\frac{1}{2}$ to $\frac{3}{4}$ line long, ovate-oblong, obtuse, the 2nd nearly as long as the 3rd, 3- or 5-nerved, the margins ciliate, the 3rd rather longer, very prominently 3-nerved, ciliate with rigid hairs proceeding from a row of prominent tubercles. Flowering glume narrow, acute.

Queensland. Rockhampton, *O'Shanesy*; Herbert's Creek, *Bowman*; Warwick, *Beckler*; also in *Leichhardt's* collection.

4. *P. papposum*, *R. Br. Prod.* 192.—Stems from a woolly or silky-villous rhizome 2 ft. high or more. Leaves flat, usually long and

narrow, the lower ones softly pubescent, the upper ones more glabrous; ligula rather long, membranous. Panicle-branches numerous, slender or filiform, spreading, 6 to 8 in. long, the lower ones vorticillate, the upper ones alternate and distant. Spikelets in distant pairs, both on capillary pedicels, one pedicel much longer than the other but both long, sometimes 1 to 2 in. at the base of the branches, the upper pedicels shorter and sometimes solitary. Spikelets scarcely 1 line long, covered in the typical form with long silky hairs spreading when in fruit. Outer glume minute or sometimes wanting, 2nd and 3rd equal, 3-nerved, both empty or the 3rd with a rudimentary palea. Fruiting glume rather acute, smooth and shining.

N. Australia. Arnhem South Bay, *R. Brown*.

Var. *leptostachyum*. Spikelets glabrous, otherwise quite similar.—*P. autumnale*, F. Muell. *Fragm.* viii. 196, but not of Bosc.—Sweers Island, *Henne*.

5. *P. sanguinale*, Linn.; Kunth, Enum. i. 82.—Decumbent and often shortly creeping and rooting at the base, ascending to 1 ft. or rather more. Leaves flaccid, flat, usually pubescent and sprinkled with long hairs especially on the sheaths, but sometimes nearly glabrous. Spikes or panicle-branches 3 to 8, crowded at the end of a long peduncle, all from nearly the same point or shortly distant, $1\frac{1}{2}$ to 3 in. or in some varieties above 4 in. long, the rhachis slender but angular, flexuose, scabrous-ciliate. Spikelets in pairs, one nearly sessile the other pedicellate, oblong, rather acute, about $1\frac{1}{2}$ lines long. Outer glume minute, rarely above $\frac{1}{4}$ line long, 2nd glume lanceolate, 3-nerved, from $\frac{1}{2}$ to $\frac{3}{4}$ the length of the spikelet, 3rd glume usually 5-nerved, glabrous or slightly ciliate in the Australian specimens, empty. Fruiting glume shorter, smooth.—*Trin. Spec. Gram.* t. 93, 144; *Digitaria sanguinalis*, Scop.; *Reichb. Ic. Fl. Germ.* t. 27.

N. Australia. Port Essington, *Armstrong*.

Queensland. Rockhampton and neighbourhood, *O'Shanesy, Bowman* and others; Brisbane River, Moreton Bay, *F. Mueller, Bailey* and others.

N. S. Wales. Port Jackson, *R. Brown, Woolfs* and others; Clarence River, *Beckler*; Richmond River, *Mrs. Hodgkinson*; New England, *C. Stuart*; Lord Howe's Island, *C. Moore*.

Victoria. Towang, Hume River, *Finlay*.

W. Australia. Busselton, *Pries*.

A common weed in most warm countries. Most of the Australian specimens have the glumes glabrous or nearly so. Some, however, have them more or less ciliate with soft hairs on the lateral nerves or margins, which constitutes the *P. ciliare*, Retz; *Kunth, Enum.* 1. 82.

6. *P. ctenanthum*, F. Muell. *Fragm.* viii. 153.—A tufted erect glabrous grass, perhaps annual. Leaves flat, narrow, the ligula prominent and the lamina usually ciliate at the base with a few long hairs. Spikes or panicle-branches 2 together from the end of the peduncle, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long. Spikelets in rather distant pairs, appressed to the rhachis, one sessile the other pedicellate, both 2 to near 3 lines long, with a minute almost microscopic outer glume, the 2nd glume

lanceolate, ciliate, about $\frac{3}{4}$ the length of the spikelet, and the 3rd glume empty, but the spikelets otherwise different, the sessile one usually male by abortion though occasionally fertile, the 3rd glume broad, 7- to 9-nerved and ciliate with soft hairs; the pedunculate spikelet rather larger with a hermaphrodite fertile flower, the 3rd glume with only 3 very prominent nerves, ciliate with long rigid bristles arising from tubercles, otherwise glabrous.

N. Australia. Hooker's and Sturt's Creeks, *F. Mueller*; Dampier's Archipelago, *Walcot*.

Munro considers this as very closely allied to the variety *ciliare* of *P. sanguinale*, in which the two spikelets are sometimes dissimilar, but if only a variety it is a very marked one.

7. *P. stenostachyum*, Benth.—A tufted slender glabrous grass, branching at the base, 6 in. to 1 ft. high. Leaves flat, the ligula very short scarious and jagged. Spikes or panicle-branches 2, filiform, 1 to $1\frac{1}{2}$ in. long, the terminal one erect, the other spreading and attached lower down. Spikelets appressed to the rhachis, mostly in pairs, one sessile the other on a rather long pedicel, or rarely solitary or both pedicellate, about 1 line long, very narrow, acuminate. Outer glume minute or obsolete, the 2nd and 3rd membranous, rather acute, ciliate, both empty, the 2nd usually 3-nerved, the 3rd rather larger and 5-nerved. Fruiting glume nearly as long, smooth and shining.

N. Australia. Upper Victoria River, *F. Mueller*.

8. *P. tenuissimum*, Benth.—Erect, very slender, much branched at the base, often above 1 ft. high. Leaves short and narrow, quite glabrous, the ligula short scarious and jagged. Spikes or panicle-branches few, usually 3, filiform, spreading, distant, 1 to $1\frac{1}{2}$ in. long. Spikelets in pairs, ovoid, quite glabrous, but little more than $\frac{1}{2}$ line long, both pedicellate, but one pedicel twice as long as the other. Outer glume minute, almost microscopic, orbicular, the 2nd and 3rd nearly equal, both empty, obtuse, membranous, 3- to 5-nerved. Fruiting glume rather acute, usually slightly exceeding the empty ones.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*; Rockhampton, *O'Shanesy*.

9. *P. parviflorum*, R. Br. Prod. 192.—A tall but slender usually glabrous grass. Leaves long and narrow, the ligula scarious, often long, jagged at the end. Panicle-branches often numerous, spreading, simple, filiform, 2 to 4 in. or in some specimens 5 to 6 in. long, the lower ones distant, the upper ones often crowded. Spikelets ovoid, glabrous, $\frac{1}{2}$ to $\frac{3}{4}$ lines long, mostly in pairs along the flexuose rhachis, one on a longer pedicel than the other; but in the lower part of the branch often clustered, the longer pedicel bearing 2 or 3 spikelets. Outer glume very small, ovate, usually 1-nerved, 2nd and 3rd glumes nearly equal,

both empty, membranous, obtuse, the 2nd usually 3-nerved, the 3rd 5-nerved. Fruiting glume as long, more acute, smooth.

Queensland. Rockhampton, *O'Shanesy, Thozet*; Brisbane River, Moreton Bay, *F. Mueller, M'Gillivray* and others.

N. S. Wales. Port Jackson, *R. Brown, Woots*; New England, *C. Stuart*; Clarence River, *Beckler, Wilcox*; Richmond River, *Mrs. Hodgkinson*; also in *Leichhardt's* collection.

Var. *pilosa*, more or less hairy.—Moreton Bay, *Bailey*.

P. striatum, *R. Br. Prod.* 192 (*P. australe*, *Spreng. Syst.* i. 309), from Botany Bay, *Banks and Solander*, and Port Jackson, *R. Brown*, appears to me to be a form of *P. parviflorum* with the outer glume quite microscopical or in many spikelets deficient, so as to bring it near some *Paspala*, but the spikelets are not flattened and the other characters are those of *P. parviflorum*. *P. ramulare*, *Trin. Gram. Pan. Diss.* ii. 244, not taken up by *Kunth*, appears from the character given not to differ from *P. parviflorum*.

10. **P. Baileyi, Benth.**—A glabrous rather slender grass of $1\frac{1}{2}$ to 2 feet, with the inflorescence of *P. parviflorum*, but the spikelets rather of *P. divaricatissimum*. Leaves flat, narrow, the ligula shortly prominent, scarious, not ciliate. Panicle of several simple filiform branches of 3 or 4 in., all distant or the upper ones rather crowded or the lower ones sometimes clustered not verticillate. Spikelets narrow-ovoid, rather acute, nearly 1 line long, mostly in pairs, one on a much longer pedicel than the other, or in the lower part of the branch the longer pedicel with 2 or 3 spikelets. Outer glume very small, ovate, 1-nerved, the 2nd and 3rd glumes nearly equal, fringed with rather long hairs spreading when in fruit, the 2nd usually 5-nerved, the 3rd rather broader and 7-nerved. Fruiting glume acute, smooth and shining.

Queensland. Port Curtis, *M'Gillivray*; Brisbane River, *Bailey*.

SERIES II. TRICHACHNEÆ.—Spikelets silky-hairy or fringed with long hairs, sessile or shortly pedicellate, clustered or rarely in pairs along the rhachis of the simple spikelike panicle or of the 2 or 3 long erect branches.

11. **P. gibbosum, R. Br. Prod.** 193.—Erect, branching at the base, 1 to $1\frac{1}{2}$ ft. high. Leaves narrow, erect, glabrous except a few hairs at the orifice of the sheaths. Panicle simple, spikelike, slender but dense, 2 to 3 in. long, with a flexuose rhachis, or very rarely 2 spikelike erect branches. Spikelets in pairs along the rhachis, one sessile the other pedicellate or 3 to 6 together in clusters or on short branches at the base of the spike, all narrow, silky-hairy, about 1 line long, with a few long cilia usually at their base, or on the pedicel. Outer glume deficient; empty glumes 2, covered with long silky hairs, the lowest lanceolate, very thin and nerveless, the other rather longer, ovate, very thin but distinctly 3- or 5-nerved. Fruiting glume hard, smooth, somewhat gibbous at the base, with a rather prominent keel.—*Kunth, Revis. Gram. t.* 105; *F. Muel. Fragm.* viii. 155.

N. Australia. North Coast, *R. Brown*; Victoria River, *F. Mueller*.

Queensland. Rockhampton, *O'Shanesy*.

A variable plant scarcely to be distinguished from the simple spiked forms of *P. leucophæum*, except by the apparently total absence of the minute outer glume, and in this respect this species closely connects *Panicum* with *Paspalum*. Its close affinity to *P. leucophæum* prevents its removal from the former genus.

12. *P. leucophæum*, *H. B. et K. Nov. Gen. et Sp.* i. 97.—Stems from a branching base 1 to 2 ft. high. Leaves narrow, long or short, usually glabrous. Panicle of few long slender and erect spikelike branches, very unequal and sometimes reduced to 2 nearly equal ones or to a single one, the longest 3 to 4 in. or in some very lax Queensland specimens 5 in. long; secondary branches short, slender, erect, the lower ones with 4 or 5 sessile or pedicellate spikelets, the upper ones with only 1 or 2. Spikelets scarcely $1\frac{1}{2}$ lines long, rather acute, densely covered with long silky, silvery or purple hairs, often spreading when in fruit. Outer glume scarcely $\frac{1}{4}$ line long, obtuse, 2nd and 3rd glumes nearly equal and empty, both densely hairy, the 2nd usually 3-nerved, the 3rd 5-nerved. Fruiting glume shorter, smooth, rather acute and often slightly gibbous at the base.—*P. villosum*, *R. Br. Prod.* 192; *P. Brownii*, *Rœm. and Schult. Syst.* ii. 462; *F. Muell. Fragm.* viii. 155; *P. glareæ*, *F. Muell. in Linnæa*, xxv. 445; *P. laniflorum*, *Nees in Hook. Lond. Journ.* ii. 410.

Queensland. Keppel Bay and Broad Sound, *R. Brown*; Rockhampton, *O'Shaunessy*; Rockingham Bay, *Dallachy*; also in *Leichhardt's* collection.

N. S. Wales. Western interior, *A. Cunningham*; New England, *C. Stuart*; Clarence River, *Beecker*; Darling River to the Barrier Range and Cooper's Creek, *Victorian and other Expeditions*.

Victoria. Snowy River, *F. Mueller*.

S. Australia. Crystal Brook, *F. Mueller*.

Var. monostachyum. Spike simple as in *P. gibbosum*, but the outer glume present.—Goyinga Mountains, *Victorian Expedition*.

Also in tropical America and Africa. The Australian specimens vary much, especially in the degree of development of the inflorescence and the size of the spikelets. Some of Brown's from Shoalwater Bay and Thirsty Sound, originally marked by him as *P. sericeum*, have 10 or more branches to the panicle and smaller spikelets and may possibly prove to represent a distinct species.

13. *P. semialatum*, *R. Br. Prod.* 192.—Stems erect, 2 to 3 ft. high, silky-pubescent about the nodes, otherwise glabrous or nearly so. Leaves narrow with involute margins or subulate, usually pubescent, the lower ones sometimes densely clothed with long silky hairs. Panicle 3 to 6 in. long, consisting of 2 to 5 long erect or slightly diverging branches, clustered at the end of a long peduncle. Spikelets 2 to $2\frac{1}{2}$ lines long, few together in erect clusters or short branches along the rachis. Glumes all ending in a short subulate point, the outer one membranous, 3-nerved, about half the length of the spikelet, the 2nd the largest, membranous, 5-nerved, fringed on each side with long pale or dark-coloured hairs spreading in fruit and connected at the base on the intramarginal nerve; 3rd glume more rigid though thin, with a small palea and sometimes 3 stamens in the axil. Fruiting glume more

rigid, with a rather longer point, the palca also rigid, but the inflexed margins thin with a distinct lobe at the base on each side.—F. Muell. *Fragm.* viii. 196; *Urochloa semialata*, Kunth, *Enum.* i. 74; *Coridochloa semialata*, Nees, in various catalogues and herbaria (the genus not published as generally quoted in *Edinb. New Phil. Journ.* 1832, July).

N. Australia. Upper Victoria River and M'Adam Range, *F. Mueller*; Escape Cliffs, *Hulse*; Sweers Island, *Henne*; Port Darwin, *Schultz*, n. 146, 192, 662, 784, 801; Port Essington, *Armstrong*.

Queensland. Keppel Bay and Broad Sound, *R. Brown*; Endeavour River, *A. Cunningham*; Percy Islands, *Walter*; Port Curtis, *M'Gillivray*; Port Denison and Rockingham Bay, *Dallachy*; Rockhampton, *Thozet*, *O'Shanesy*; Moreton Bay, *C. Stuart*, *Leichhardt*, *M'Gillivray*; Warwick, *Beckler*.

N. S. Wales. Liverpool Plains, *A. Cunningham*; Darling Downs, *Woolfs*.

Extends over tropical Asia from Ceylon and the Peninsula to the Malayan Archipelago and South China.

SERIES III. PASPALOIDEÆ.—Spikelets sessile or very shortly pedicellate in 1 or 2 rows, very rarely in pairs, along the short simple often distant spikes or spikelike branches of the panicle, rarely reduced to a single terminal one-sided spike.

14. **P. rarum**, *R. Br. Prod.* 189.—Stems slender, branching and sometimes creeping at the base, ascending to about 1 ft. Leaves very narrow, glabrous or the lower sheaths slightly hispid. Spike simple, slender, 2 to 4 in. long. Spikelets mostly singly sessile and distant, but sometimes in pairs at the base of the spike, one sessile the other pedicellate, all ovoid, obtuse, 1 line long or rather more, glabrous. Outer glume broad, 3- or 5-nerved, about half as long as the spikelet, 2nd and 3rd nearly equal, both membranous, 5-nerved, empty. Fruiting glume acute, transversely rugose, seated on a semi-annular cartilaginous disk.—*Kunth, Rev. Gram.* t. 15.

N. Australia. Islands of the North Coast, *R. Brown*.

15. **P. argenteum**, *R. Br. Prod.* 190.—Stems erect, under 1 ft. high. Leaves short, flat, softly pubescent. Panicle of few (3 to 5) erect slender distant branches, the rachis almost filiform. Spikelets few, distant, erect, broadly turbinate and as it were truncate, about 1 line long, crowned by long silvery hairs. Outer glume not half the length of the spikelet, ovate, silky-hairy; 2nd and 3rd glumes both empty and similar, very broad and almost truncate, membranous, nerveless and silky-pubescent in the lower half, several-nerved with silvery-white rather long hairs at the end. Fruiting glume ovoid-oblong, glabrous, smooth.—*Trin. Spec. Gram.* t. 170.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*. The analytical details in *Trinius*'s plate appear to be taken from the *P. holosericeum*, they do not at all agree with the spikelets examined of *Brown's P. argenteum*.

16. **P. holosericeum**, *R. Br. Prod.* 190.—Stems from a branching

base, erect, slender, mostly under 1 ft. high, more or less hairy as well as the foliage. Leaves short, narrow, acute, very spreading, the nerve-like margins usually undulate. Panicle of few (4 to 6) erect simple distant branches, the longest about $\frac{1}{2}$ in. long. Spikelets usually 5 or 6, alternate, under $1\frac{1}{2}$ lines long, but appearing longer from the long shining silvery-silky hairs with which they are covered. Outer glume acute, more than half the length of the spike, 2nd glume acute, mucronate, 3-nerved towards the end, 3rd glume nearly similar and empty but rather longer, 5-nerved at the end, with a longer point; fruiting glume much shorter, glabrous, distinctly 3-nerved at the end, with a short point, at length hardened and minutely striate.—Kunth, *Rev. Gram.* t. 18; *Trin. Spec. Gram.* t. 173.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Victoria River, *F. Mueller*; Port Darwin, *Schultz*, n. 14, 113, 136, 138, 830; Arnhem's Land, *McKinlay*; the latter specimens with smaller spikelets, approaching those of *P. argenteum*, but not truncate.

17. ***P. flavidum*, Retz, Obs. iv. 15.**—Stems erect, branching at the base, rather rigid, attaining 1 to 2 ft. or rather more. Leaves acute, sometimes rather broad but the margins involute when dry, glabrous except a few short hairs at the orifice of the sheath. Panicle of several often numerous erect distant branches or sessile spikes, the lowest sometimes above $\frac{1}{2}$ in. long, the upper one shorter, the rachis flexuose, slightly dilated. Spikelets sessile in about 2 rows, in the typical form very oblique, ovoid, about $1\frac{1}{2}$ lines long or rather more in several Australian specimens. Outer glume very short, broad and obtuse, the second glume the largest, broad, several-nerved, very concave and incurv'd, the third smaller, flat on the back, enclosing a palea large and broad in the typical form but no stamens. Flowering glumes usually shortly acuminate.—*R. Br. Prod.* 190; *P. brizoides*, *Jacq. f. Ecl. Gram.* 2, t. 2, *Trin. Spec. Gram.* t. 158.

N. Australia. Upper Victoria River, *F. Mueller*; the specimens quite similar to Indian ones.

Queensland. Herbert's Creek, *Bowman*; Peak Downs, *Barkitt*; Springsure, *Wuth*, the spikelets rather larger than usually in India.

Var. tenuior. Spikelets rather small, not quite so oblique, the palea within the third glume usually very small, the fruiting glume very rugose.

Queensland. Endeavour River, *Banks and Solander*; Warwick, *Beckler*.

N. S. Wales. Port Jackson, *R. Brown*; Camden, *Woolfs*; in the interior, *A. Cunningham*; New England, *C. Stuart*.

The species extends over tropical Asia, but apparently not into Africa or America. It has been united by *F. Mueller*, *Fragm.* viii. 189, with the following under the name of *P. brizoides*, *Linn.*, a view in which I am unable to concur. I find great confusion among the different plants to which different authors have given that name. The original *P. brizoides*, *Linn.*, is shown by his herbarium as by his description to be the same as his *P. colonum*. *P. brizoides* of *Retz*, *Obs.* v. 18, and *Willd. Spec.* i. 338, is evidently the *P. fluitans*, *Retz*, *Obs.* iii. 8, which he had originally described imperfectly and therefore failed to recognise, but the specimens originally sent from India show it to be the common Indian semi-aquatic species remarkable in the whole genus by the second glume short and truncate like the first. This

species, though so common in India, has not yet been found in Australia. The American plant designated by Swartz as *P. brizoides* and found also in Africa and Asia but not in Australia, and readily known by the male flower in the third glume, is the *P. paspaloides*, Pers., and probably the *P. fluitans* of Retz, Obs. v. 18 and Willd. Spec. i. 338 (not the one formerly so named by Retz). *P. brizoides* of Jacquin and Trinius is as above quoted the *P. flavidum*, Retz.

18. **P. gracile**, *R. Br. Prod.* 190.—Erect, much branched towards the base, quite glabrous, usually slender, from under 1 ft. to above $1\frac{1}{2}$ ft. high, but exceedingly variable in stature and aspect. Leaves from very narrow to rather broad. Panicle usually long and slender, the branches or sessile spikes or clusters erect, distant, the lower ones 3 to 4 lines or rarely $\frac{1}{2}$ to 1 in. long, the upper ones smaller, often reduced to short clusters or to single spikelets towards the end of the panicle, the rachis of the branches often but not always produced beyond the last spikelet into a point sometimes as long as the spikelet. Spikelets singly sessile or in pairs, one pedicellate the other sessile along the rachis, rarely more or less distinctly in 2 rows almost as in *P. flavidum*, ovoid, 1 to $1\frac{1}{4}$ lines long, nearly straight, the outer glume ovate acute rather less or more than half as long as the spikelet, the second and third nearly equal, both empty membranous and about 5-nerved, fruiting glume as long or rather longer, minutely transversely rugose.

N. Australia. Port Essington, *Armstrong*.

Queensland. Keppel Bay, *R. Brown*, an elongated form with very narrow leaves, and the spikelets irregularly arranged almost clustered on the lower branches; Rockingham Bay, *Dallachy*, and numerous localities in southern Queensland, *O'Shanesy*, *Thozet*, *Bowman* and others, and a var. with very small spikelets; Herbert's Creek, *Bowman*.

N. S. Wales. New England, *C. Stuart*; Shoalhaven, *C. Moore*; Clarence River, *Wilcox*, a very narrow-leaved form with only 3 or 4 spikelets even on the lower branches of the panicle; in the western interior, *A. Cunningham*, *Mitchell*, *Giles* and others.

Victoria. Mount Hope and Murray River, *F. Mueller*.

S. Australia. Wulpena and Cudnaka, *F. Mueller*.

W. Australia. *Drummond*, 1st coll., also n. 101, the latter a very small plant, with few spikelets.

P. jubiflorum, Trin. Gram. Panic. Diss. ii. 150, was described from a remarkably luxuriant specimen of *P. gracile* gathered by Mitchell, with a panicle nearly 1 ft. long and the lower spikelet about 1 in., with rather numerous spikelets in 2 rows; other specimens of Mitchell's are not half that size. *P. distans*, Trin. Spec. Gram. t. 172, represents the slender depauperate form as gathered by Drummond and others. *Paractænum Nova-Hollandiæ*, Beauv. Agrostogr. 47, t. 10, f. 6, (*Panicum paractænum*, Kunth, Enum. i. 134), appears to me from the figure and description, also to refer to a starved form of the species, but not so slender as the above-mentioned *P. distans*. The variations of *P. gracile* are however sometimes so great that it is difficult to reduce all the forms to one species without having seen the almost insensible gradations which unite them.

To this first group of *Paspaloid Panicæ* may be referred also the *P. culicinum*, F. Muell. Fragm. viii. 189, which is *P. obtusum*, H. B. et K., a Mexican grass raised in the Warrego district of Queensland as 'Mosquito grass,' a name unknown in Mexico, but under which, as we learn in a note of J. Gay's, seeds were originally transmitted from Washington to Paris, the name probably derived from some confusion with the *Mezquite*, the pod of a *Prosopis*. The species is easily distinguished among *Paspaloid*

Panica by the large obtuse spikelets, with the outer glume nearly as long as the others, and with a male flower in the third glume.

19. **P. prostratum**, *Lam. Illustr. i. 171.*—Stems decumbent or creeping and rooting at the base, ascending to 1 ft. or more. Leaves lanceolate, 1 to 2 in. long or in luxuriant specimens twice as long, glabrous except a few cilia at the base of the lamina and orifice of the sheath, or sometimes with the sheath more hairy. Panicle of 3 to 10 simple branches 1 to $1\frac{1}{2}$ in. long, usually crowded at the end of the peduncle, but sometimes more distant and spreading. Spikelets rather crowded along the rhachis, but often in pairs, 1 sessile the other pedicellate, or rarely the lower pedicels bearing 2 spikelets, ovoid, rather above 1 line long and almost acute, glabrous but occasionally with a few capillary bristles on the rhachis and pedicels. Outer glume very short and broad, obtuse or almost acute, the 2nd and 3rd nearly equal, 3- or 5-nerved, the 3rd with a large palea and sometimes a male flower in its axil. Fruiting glume smooth, very obtuse, but occasionally tipped by a minute point.—*Trin. Spec. Gram. t. 184, 185.*

N. Australia. Upper Victoria River, *F. Mueller*; Gulf of Carpentaria, *Lansborough*.

Generally distributed over tropical Asia, it is also in Africa and the West Indies.

20. **P. helopus**, *Trin. in Spreng. Neue Entd. ii. 84.*—Stems usually rather tall. Leaves lanceolate, often rather broad and cordate at the base with loose sheaths, usually more or less hirsute especially the sheath, but sometimes nearly glabrous. Panicle of few simple branches, sometimes 3 to 5 almost sessile above the last leaf, sometimes 6 or 7 on a rather long peduncle. Spikelets irregularly alternate in 2 rows along the rhachis, or the lower ones clustered and the upper ones more distant, ovoid, acute, nearly 2 lines long, pubescent villous or glabrous. Outer glume very short and broad, 3-nerved, the 2nd about 7-nerved, the 3rd about the same length but narrower, 5-nerved, with a palea in its axil but no stamens. Fruiting glume minutely rugose, obtuse, but the central nerve produced into a short awnlike point not exceeding the empty glumes.—*Trin. Spec. Gram. t. 183*; *Urochloa pubescens*, *Beauv.*; *Kunth, Enum. i. 74*; *U. panicoides*, *Beauv. Agrost. 52, t. 11*; *Kunth, l. c. and Revis. Gram. t. 14.*

N. S. Wales. Darling River, *Dallachy*, and thence to Cocper's Creek, *Neilson*.

Var. *glabrior*. Spikelets more numerous, loosely and irregularly arranged along the rhachis.

N. Australia. Lower Victoria River, *F. Mueller*.

The species is common in tropical Asia and Africa. It is readily known by the point or short awn of the fruiting glume resembling that of *Eriochloa punctata*, of which the plant has also something of the aspect, but the spikelet has the outer glume developed and is not seated on the peculiar disk-like base of that genus. *Kunth* having adduced as a synonym to *U. panicoides*, *P. javanicum*, *Poir.*, that name

has been adopted as the oldest by Steudel and others, but Poiret's description does not apply to our plant, and Munro has seen authentic specimens which are quite different.

21. ***P. Gilesii*, Benth.**—Stems 6 to 10 in. high, leafy to the top, with a few long hairs scattered on the leaf-sheaths, the lamina flat. Panicle of 2 or 3 simple branches, close together and half enclosed in the uppermost leaf-sheath in all the specimens seen, under 1 in. long. Spikelets closely resembling in size and shape those of *P. helopus*, ovoid, acute or acuminate, $1\frac{1}{2}$ lines long or rather more, sessile in 2 rows on a glabrous rhachis. Outer glume minute, hyaline, concealed by the long hairs which cover it; 2nd glume prominently 7-nerved, acute or acuminate, shortly hairy; 3rd about the same length, 3- or 5-nerved, bordered on each side below the middle by long spreading hairs, with a broad hyaline palea in its axil; fruiting glume much shorter, coriaceous, obtuse with the point or short awn of *P. helopus*.

Central Australia. Charlotte Waters, *Giles*.

22. ***P. piligerum*, F. Muell. Herb.**—Closely resembles some of the longer more hairy specimens of *P. helopus*. Leaves rather narrow, 6 to 8 in. long. Panicle of 3 to 5 erect simple branches 1 to near 2 in. long. Spikelets ovoid, acute, nearly 2 lines long, alternate along the rhachis but rather distant so as to appear in a single row. Glumes hairy, the outer one short, 3-nerved; 2nd and 3rd glume 5-nerved, the third rather narrower than the 2nd but both empty and equal in length. Fruiting glume shorter, coriaceous, obtuse, without any or only a very minute and deciduous terminal point, minutely transversely rugose.

N. Australia. Victoria River, *F. Mueller*.

23. ***P. polyphyllum*, R. Br. Prod. 190.**—Stems from a decumbent and branching base lengthening and ascending to above 2 ft. Leaves lanceolate, pubescent, with nerve-like frequently undulating margins. Panicle slender, of few distant simple slender secund and spreading branches, the lower ones 1 to $1\frac{1}{2}$ in. long, the upper ones shorter. Spikelets rather distant along the rhachis, alternate but not in 2 distinct rows, ovoid, acute, about $1\frac{1}{2}$ lines long, contracted at the base and sometimes shortly pedicellate, with a few hairs or bristles on the pedicel. Outer glumes thinly membranous, the lowest about half as long as the spikelet, broad, rather acute, 3-nerved, the 2nd and 3rd nearly equal, the 2nd with five, the 3rd with three prominent nerves. A narrow palea in the 3rd glume. Fruiting glume smooth or minutely rugose under a strong lens.—Trin. Spec. Gram. t. 177; F. Muell. Fragm. viii. 191.

N. Australia. Islands off the North Coast, *R. Brown*; Port Essington, *Armstrong*; Port Darwin, *Schultz*, n. 34, 148, 191, 818.

24. **P. distachyum**, Linn.; Kunth, *Enum.* i. 91.—Stems decumbent or creeping and rooting at the lower nodes, slender and ascending to 1 ft. or rather more. Leaves flat, glabrous or with a few hairs especially at the orifice of the sheaths. Panicle of few (usually 2 to 4 but occasionally 6 or 7) distant simple secund branches 1 to 2 in. long, at first erect, at length spreading or reflexed, the rhachis slender or slightly dilated, often sprinkled with a few hairs. Spikelets sometimes loosely alternate along the rhachis almost in a single row, sometimes more numerous and approximate in 2 distinct rows, sessile or shortly stipitate, ovoid, rather acute, $1\frac{1}{2}$ lines long, quite glabrous. Outer glume scarcely half the length of the spikelet, thin, very broad, the margins overlapping each other, 2nd and 3rd glumes nearly equal, prominently 3-nerved; a narrow palea in the 3rd. Fruiting glume nearly as long, very obtuse, hardened but the 3 nerves very visible.—*P. subquadruparum*, Trin. Spec. Gram. t. 186 (with a loose sparing inflorescence).

Queensland. Rockhampton, *O'Shanesy*; Bokhara Flats, *Leichhardt*.

S. Australia. Near Lake Eyre, *Andrews*.

Widely distributed over East India and the Malayan Archipelago.

25. **P. reversum**, *F. Muell. Fragm.* viii. 152.—A weak glabrous rather glaucous much-branched grass. Leaves long and narrow. Panicle usually of 3 or 4 simple distant branches, at first erect but soon spreading, and at length reflexed like those of *P. distachyum*, but the rhachis generally though not always dilated, produced into a rigid point beyond the last spikelet, and bearing under the lowest spikelet a rigid linear bristle (an abortive branch?) as long as the spikelet. Spikelets not numerous, alternate and distant along the rhachis so as to appear in one row, ovoid-oblong, fully 2 lines long in some specimens, rather under 2 lines in Drummond's. Outer glume 3-nerved, obtuse, at least $\frac{3}{4}$ the length of the spikelet, 2nd and 3rd glumes equal, many-nerved, both empty in the spikelets I examined, but F. Mueller found a palea in the 3rd. Fruiting glume hardened as in the genus.

S. Australia. Near Lake Eyre, *Andrews*; Lake Amadeo, *Giles*.

W. Australia. Drummond; Murchison River, *Oldfield*.

This species seems to show some distant approach in inflorescence to the *Plagiosetum refractum*.

SERIES IV. ECHINOCHLOÆ.—Spikelets sessile and crowded in 3 or 4 rows or irregularly, along the simple alternate usually secund spikes or spikelike branches of the panicle. Glumes sometimes awned.

26. **P. colonum**, Linn.—Stems erect or decumbent at the base, 2 ft. high or more. Leaves flat, glabrous. Panicle of several (about 8 or 10) simple one-sided distant and usually erect branches or sessile spikes, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, and not diminishing much upwards. Spikelets about 1 line long, ovoid, sessile and densely crowded in about 4 rows,

the rhachis without bristles but occasionally a few small empty scales (abortive spikelets?) at the base of the spike. Outer glumes coarsely pubescent or nearly glabrous, the lowest nearly half as long as the 2nd and 3rd, which are nearly equal, often ending in short points but not awned; a palea in the 3rd glume. Fruiting glume smooth and shining.—Trin. Spec. Gram. t. 160; *Oplismenus colonum*, Kunth, Enum. i. 142.

N. Australia. Port Essington, *Armstrong*; Upper Victoria River, *F. Mueller*.

Common in the tropical and subtropical regions of the Old World and in many parts of America. *F. Mueller*, *Fragm.* viii. 198, unites it with the *P. crus-galli*, and the Australian specimens show perhaps some approach to that species, but the small awnless spikelets in more regular spikes, and the absence of any bristles on the rhachis, refer them rather to the tropical *P. colonum*. The figure of *Jacq. f. Ecl. Gram.* t. 32 does not appear to me to represent the true *P. colonum*.

27. *P. crus-galli*, Linn.—A coarse decumbent annual, ascending to 1 or 2 ft. the leaves rather broad, without any ligula. Panicle dense and usually secund, of simple branches or sessile spikes, the lowest 1 to 2 in. long, the upper ones gradually shorter, the whole panicle in some varieties densely hispid with the long purplish or green awns. Spikelets about $1\frac{1}{2}$ lines long, more or less pubescent, acuminate or awned, crowded and clustered along the branches, the rhachis usually bearing numerous cilia or capillary bristles amongst or below the spikelets. Outer glume very short and broad, 2nd and 3rd glumes nearly equal and 3-nerved, usually ciliate on the margins, the 2nd produced into a rather short awn, the 3rd in the common Australian form with an awn varying from $\frac{1}{2}$ to 1 in., and a thin palea and very rarely a male flower in its axil. Fruiting gloom smooth and shining, without any or only a very short point.—*R. Br. Prod.* 191; *F. Muell. Fragm.* viii. 198; *Trin. Spec. Gram.* t. 161, 162; *Oplismenus crus-galli*, Kunth, Enum. i. 143; *Echinochloa crus-galli*, Beauv.; *Reichb. Ic. Fl. Germ.* t. 29.

N. Australia. Victoria River and M^t Adam Range, *F. Mueller*.

Queensland. Port Molle, *A. Cunningham*; Port Denison, *Fitzalan*; Brisbane River, Moreton Bay, *F. Mueller* and others; Rockhampton and neighbourhood, *O'Shanesy* and others.

N. S. Wales. Paterson River, *R. Brown*; Port Jackson to the Blue Mountains and northward to New England, *Woolfs*, *C. Moore*, *C. Stuart* and others.

Victoria. Wimmera, *F. Mueller*.

W. Australia. Swan River, *Helmich*.

A common weed in most hot and some temperate countries and very probably only as an introduced weed in several of the Australian localities, most frequently the long-awned state of the plant, but occasionally with the awns short or reduced to short points as is frequently the case in Europe.

P. lacunarum, *F. Muell.* in *Trans. Vict. Inst.* 1855, 47, from around the lagoons of the Murray, is reduced by *F. Mueller*, viii. 198, to a variety of *P. crus-galli*. The panicle is narrower than usual with fewer more distant branches, no cilia on the rhachis, the spikelets rather large, mostly about 2 lines long, without awns and glabrous or the nerves minutely scabrous, and there appears to be always a male flower in the third glume. The specimens much resemble a few of the awnless European ones, but the above characters may possibly prove constant.

SERIES V. MYUROIDEÆ.—Spikelets not silky, crowded and clustered in a dense continuous or rarely interrupted cylindrical spike-like panicle.

28. **P. myosuroides**, *R. Br. Prod.* 189.—Erect or slightly decumbent at the base, often 2 ft. high. Leaves long and narrow, glabrous. Spikelets ovoid, obtuse, $\frac{1}{2}$ to $\frac{3}{4}$ line long, clustered and crowded in a continuous and dense cylindrical spike or spike-like panicle 1 to 4 in. long and not above 2 lines diameter, often dark-coloured. Outer glume ovate, acute or acuminate, about half the length of the spikelet, 3-nerved; 2nd and 3rd glumes nearly equal, broad, 5- or 7-nerved; a minute palea in the axil of the 3rd.—*P. angustum*, Trin. Spec. Gram. t. 334.

N. Australia. Victoria River, *F. Mueller*; Port Darwin, *Schultz*, n. 344.

Queensland. Endeavour River, *Banks and Solander*, *A. Cunningham*; Dawson River, *F. Mueller*.

The species extends over tropical Asia and Africa, but is less common than the *P. indicum*, with which it is united in the Hong Kong Flora and by *F. Mueller*, *Fragm.* viii. 197. It appears however to be constantly distinct in the very small obtuse spikelets with straight glumes very rarely and only slightly ciliate.

29. **P. indicum**, *Linn.*; *Kunth, Enum.* i. 133.—Stems decumbent at the base, ascending to 6 or 8 in. in the smaller varieties, above 1 ft. high in the larger ones. Leaves narrow. Spike-like panicle cylindrical, continuous or rarely interrupted, $\frac{1}{2}$ to 1 in. or in some varieties 2 in. long. Spikelets crowded, narrow, acuminate and more or less curved, 1 to $1\frac{1}{2}$ or rarely nearly 2 lines long. Outer glume 3-nerved, about half the length of the spikelet or rather more, 2nd glume curved and gibbous at the base, often ciliate, 7- or 9-nerved, 3rd glume the same length but straighter and neither gibbous nor ciliate, with a small palea in its axil; fruiting glume considerably shorter.—*F. Muell.* *Fragm.* viii. 197; Trin. Spec. Gram. t. 197.

N. Australia. Near M'Adam Range, *F. Mueller*; Port Darwin, *Schultz*, n. 184; between Norman and Gilbert Rivers, *Gulliver*.

Queensland. Endeavour River, *Banks and Solander*; Wide Bay and Brisbane River, *Leichhardt*; Moreton Bay, *C. Stuart*.

N. S. Wales. Paramatta, *Woolfs*.

Widely dispersed over tropical Asia and Africa. *P. phleoides*, *R. Br. Prod.* 189, is almost exactly the typical form represented in *Herb. Linn.*; small and slender, with a short spike of $\frac{1}{2}$ to 1 in. and rather small spikelets. *P. arcuatum*, *R. Br. l. c.* is the larger perhaps the most common form, with rather larger more curved spikelets, in a spike of 1 to 2 in. The two run very much into each other.

30. **P. myurus**, *Lam.*; *Kunth, Enum.* i. 86.—A tall grass, the lower part when under water often thick and rooting at the nodes, the upper part erect, 2 to 4 ft. high, quite glabrous. Leaves flat, the lower ones sometimes $\frac{1}{2}$ in. broad. Panicle cylindrical, dense and spike-like, or lobed and interrupted at the base, 8 in. to above 1 ft. long. Spikelets crowded along the short erect branches. Outer glume thin and

hyaline, 1-nerved, mucronate-acute, under 1 line long, inserted (always?) at some distance below the others; 2nd glume 2 lines long, 3-nerved, tapering to a fine point, 3rd still longer with a longer point, 3- or 5-nerved, usually with a small palea in the axil. Flowering glume shorter, thin and hyaline at the time of flowering, slightly stiffened but not hardened round the fruit. — *Hymenachne myurus*, Beauv. Agrost. 49, t. 10. f. 8, and with some other species, Nees, Agrostol. Brasil. 273; *P. interruptum*, Willd.; Kunth, Enum. i. 87.

Queensland. Trinity Bay, *Bailey*.

A rather common tropical grass in the New and the Old World. The thinner consistency of the fruiting glume might justify the taking the species as the type of a section, but scarcely of a distinct genus.

SERIES VI. PANICULATE.—Panicle-branches usually more or less divided. Spikelets all pedicellate, except in the first four species which approach the Paspaloideæ.

31. *P. foliosum*, R. Br. Prod. 191.—Stems 1 to 2 ft. high, decumbent at the base. Leaves rather broad, usually pubescent, the nerve-like margins often undulate. Panicle loose, with few distant simple branches, the rachis flexuose and slender, the lower branches sometimes 2 to 3 in. long. Spikelets few, distant, almost sessile or distinctly pedicellate, and the lower pedicels sometimes bearing 2 spikelets, all above 2 lines long in the typical form, ovoid, acute, pubescent or glabrous. Outer glume about half as long as the spikelet, very broad, acute, with about 7 nerves, 2nd and 3rd glumes nearly equal, 5- or 7-nerved; a rather broad palea in the 3rd. Fruiting glume minutely rugose without the point of *P. helopus* and its allies, but usually with a short callous incurved tip.—F. Muell. Fragn. viii. 194.

Queensland. Bustard Bay, *Banks and Solander*; Keppel Bay, *R. Brown*; Rockhampton, *O'Shanesy, Thozet*; Moreton Bay, *F. Mueller, Leichhardt, C. Stuart*.

N. S. Wales. Clarence River, *Beckler*.

Var. ? *Petiveri*. Panicle smaller but rather more branched. Spikelets more numerous and much smaller, under 2 lines long, the lower ones on the lower primary branches sometimes several together on short secondary branches.—*P. Petiveri*, Trin. Spec. Gram. t. 176. To this variety, common in India, appear to belong some specimens from the islands off the North Coast, *R. Brown*, which I presume to be those described as *P. pubescens*, Br. Prod. 190.

32. *P. adspersum*, Trin. Spec. Gram. t. 169.—Stems ascending to 1 ft. or rather more, glabrous except the ciliate nodes. Leaves flat, rather broad and short, the sheaths broader upwards, prominently ciliate, the lamina almost cordate at the base, with a very short ciliate ligula. Panicle narrow, rather dense, $1\frac{1}{2}$ to 3 in. long, with several erect or slightly spreading branches, all glabrous without any or with very few small cilia under the spikelets. Spikelets ovoid, rather acute, quite glabrous, $1\frac{1}{2}$ to near 2 lines long, crowded or clustered in the lower part of the branches, singly sessile towards the end. Outer

glume $\frac{1}{4}$ to $\frac{1}{3}$ as long as the spikelet, rather acute, 1- or 3-nerved; 2nd and 3rd glumes nearly equal, the 2nd broad, usually prominently 7-nerved, the 3rd narrower, with about 5 nerves, and enclosing a long palea. Fruiting glume tipped with a minute point and minutely transversely rugose.

S. Australia. Near Lake Eyre, *Andrews*.

Trinius's plant is from San Domingo in the West Indies, and if it were not on the authority of Munro, I should have great hesitation in uniting with it this one from Central Australia, but I can find nothing to separate the specimens from these two distant regions, although Trinius's figure represents a much looser and less copious inflorescence than that of the Australian plant.

33. *P. inæquale*, F. Muell. Fragm. viii. 189.—Stems erect, 1 to 2 ft. high. Leaves rather long and narrow, glabrous except a few hairs at the orifice and sometimes on the upper part of the sheaths. Panicle long and narrow, secund, the branches distant, the upper ones short and simple, the lower ones $\frac{1}{2}$ to 2 in. long, slender, simple or with a few short branches and sometimes in pairs. Spikelets alternate along the rhachis, sessile or nearly so, quite glabrous, about $1\frac{1}{2}$ lines long. Outer glume about $\frac{1}{4}$ the length of the spikelet, very broad and obtuse, prominently 5- or 7-nerved, the 2nd glume about twice the length of the lowest and half the 3rd, very broad and obtuse, prominently 9- to 13-nerved; 3rd glume many-nerved like the 2nd but more acute, grooved on the back, the margins inflexed or involute, with a large palea in its axil. Fruiting glume shorter, acuminate, more or less curved, contracted at the base, transversely rugose.

Queensland. Dawson River, *F. Mueller*; Herbert's Creek, *Bowman*, in the latter specimens the rhachis of the panicle-branches is sometimes produced beyond the last spikelet into a short awnlike point almost as in *Chamæraphis*.

34. *P. uncinulatum*, R. Br. Prod. 191.—Glabrous erect and much branched, attaining sometimes 8 ft. (*F. Mueller*), the nodes often much thickened. Leaves flat, narrow, tapering into fine points. Panicle terminal, loose and slender, consisting of few distant spreading simple or scarcely divided branches, the rhachis almost filiform. Spikelets few and distant along the branches, usually purplish, $2\frac{1}{2}$ to 3 lines long. Outer glume lanceolate, about half the length of the spikelet, the 2nd and 3rd nearly equal, acutely acuminate, 7- or sometimes 9-nerved, sprinkled with short erect rigid hooked hairs; a small palea in the 3rd. Fruiting glume smaller, quite smooth.

Queensland. East Coast, *R. Brown*; Wide Bay, *Leichhardt*; Burnett River, *F. Mueller*; Herbert's Creek, *Bowman*; Rockhampton, *O'Shanesy*, *Thozet*; Warwick, *Bekler*.

35. *P. majusculum*, F. Muell. Herb.—Erect, rigid, but not stout. Leaves flat, sprinkled with a few long hairs, the orifice of the sheath ciliate with long hairs, but no prominent ligula. Panicle of few slender spreading rather rigid slightly divided branches, each bearing 1 or 2 spikelets on filiform pedicels. Spikelets nearly 3 lines long,

ovoid, acute, straw-coloured, glabrous. Outer glume half the length of the spikelet or rather more, broad, acute, 3-nerved; 2nd and 3rd equal, acutely acuminate, 7-nerved, both empty. Fruiting glume obtuse, smooth, raised above the others by a stipes or prolongation of the rhachis, dilated into an orbicular disk or membrane under the glume.

N. Australia. Victoria River, *Elsey*.

36. P. pauciflorum, R. Br. Prod. 191.—A low much-branched grass, more or less sprinkled with long spreading hairs, rarely quite glabrous. Leaves narrow, with short sheaths, the ligula very short or scarcely prominent, ciliate. Panicles in the axils of the numerous floral leaves, often scarcely exceeding them, reduced to very few unequal spreading capillary branches, each bearing 1 to 3 spikelets, all pedicellate, glabrous, acute, about 2 lines long. Outer glume broad, fully half as long as the spikelet, acute, 3- or 5-nerved; 2nd and 3rd nearly equal, acutely acuminate, finely 5- or 7-nerved; a minute palea in the 3rd. Fruiting glume oblong, rather acute, smooth and shining, not much above half the length of the other glumes, but raised above them by a stipes or prolongation of the rhachis bordered under the spikelet by a broad short hyaline membrane.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

Var. *fastigiatum*, very much branched and leafy, the inflorescence not exceeding the floral leaves.—Upper Victoria River, *F. Mueller*; in the interior, *M'Dougall Stuart*; near Alice Springs, *Giles*.

37. P. semitonsum, F. Muell. Herb.—Erect, slender, apparently about 2 ft. high. Leaves narrow, glabrous, the ligula scarcely prominent, minutely ciliate. Panicle narrow, erect, not much branched, 3 to 6 in. long, the primary branches rather distant, the secondary ones very short, sometimes reduced to clusters of 2 or 3 spikelets. Spikelets rather crowded, very shortly pedicellate, nearly 2 lines long. Outer glume acute or acuminate, from $\frac{1}{3}$ to above $\frac{1}{2}$ the length of the spikelet, with 3 prominent shortly serrate-ciliolate nerves; 2nd glume acutely acuminate, with 3 or 5 very prominent tuberculate ciliate nerves; 3rd rather larger and more obtuse, thinner, with 5 or 7 nerves and sometimes a few cilia at the top, enclosing a male flower with a large acute palea. Fruiting glume rather shorter, narrow, acute, smooth.

N. Australia. Victoria River, *Elsey*; near Providence Hill, *F. Mueller*.

38. P. antidotale, Retz; Kunth, Enum. i. 125.—A tall glabrous grass. Leaves flat, flaccid, the ligula very short and jagged or almost ciliate. Panicle pedunculate, loose, narrow and 3 or 4 in. long in some specimens, spreading and 8 in. to 1 ft. in others, with divided filiform branches, the lower ones usually clustered. Spikelets crowded on the short ultimate branches, in sessile clusters or short spikes, but shortly pedicellate in the clusters, more acuminate than in *P. repens*, $1\frac{1}{4}$ to $1\frac{1}{2}$ lines long. Outer glume less than $\frac{1}{2}$ the length of the spikelet and sometimes only $\frac{1}{4}$, broad, acute; 2nd and 3rd glumes nearly equal,

acuminate, almost mucronate, about 7-nerved; a male flower in the 3rd. Fruiting glume scarcely shorter, rather acute, smooth and shining.

N. Australia. North-west Coast, Point Cunningham, Cygnet Bay, *A. Cunningham*; Enderby Island, *Walcot*.

39. **P. repens**, *Linn.*; *Kunth, Enum.* i. 103.—Stems from a creeping and rooting base ascending to 1 or 2 ft., rather stiff, the nodes glabrous. Leaves narrow, more or less pubescent or hairy or sometimes quite glabrous; ligula short, ciliate. Panicle narrow, with a few long branches, erect or at length spreading, the spikelets shortly pedicellate, irregularly crowded on short secondary branches, with a filiform flexuose rhachis. Spikelets $1\frac{1}{2}$ lines long, glabrous, or the nerves of the glumes minutely ciliate. Outer glume less than $\frac{1}{2}$ the length of the spikelet, acute, 1-nerved; 2nd and 3rd glumes nearly equal, acute or acuminate, prominently 3- or 5-nerved; a male flower in the 3rd. Fruiting glume acute, smooth or minutely rugose.—*P. arenarium*, *Brot. Phyt. Lusit.* i. 15, t. 6; *P. airoides*, *R. Br. Prod.* 190.

N. Australia. Gulf of Carpentaria, *R. Brown, F. Mueller*; Port Darwin, *Schultz, n.* 663; Sweers Island, *Henne*.

Queensland. Endeavour River, *Banks and Solander*.

N. S. Wales. Glendon, *Leichhardt*; Murray River, *F. Mueller*, perhaps introduced.

The species is common in maritime districts in southern Asia, northern Africa and southern Europe, and apparently also on the coasts of Brazil.

40. **P. capillipes**, *Benth.*—Foliage of the glabrous varieties of *P. repens* and spikelets similarly 2-flowered, but the inflorescence nearer that of *P. decompositum*. Leaves narrow and rather long, the ligula scarcely prominent. Panicle at length exerted from the last leaves, not very spreading, 3 to 6 in. long, with numerous capillary flexuose divided branches, the lower ones clustered. Spikelets all on capillary pedicels, rather above 1 line long. Outer glume less than half the length of the spikelet, 3-nerved, acute; 2nd and 3rd glumes nearly equal, acute or acuminate, 5-nerved. A male flower in the 3rd glume. Fruiting glume rather acute, smooth or very minutely rugose.

N. Australia. Escape Cliffs, *Hulse*; Port Darwin, *Schultz, n.* 806.

P. maximum, *Linn.*, known under the name of Guinea Grass, has been sent from Brisbane as an escape from cultivation. It is an erect grass of 3 to 5 ft., with long and rather broad leaves. Panicle large and loose, with numerous capillary much divided branches. Spikelets numerous, all pedicellate, $1\frac{1}{4}$ to $1\frac{1}{2}$ lines long, obtuse. Glumes membranous and obtuse, the outer one about $\frac{1}{2}$ the 2nd and 3rd. A male flower in the 3rd. Fruiting glume acute, slightly rugose.

41. **P. pygmæum**, *R. Br. Prod.* 191.—A small species, creeping and rooting at the nodes, ascending to about 6 in. Leaves rarely above 1 in. long, linear or lanceolate, ciliate and usually but not always sprinkled with long hairs. Panicle short and spreading, with a few capillary flexuose simple or slightly divided branches. Spikelets few

and distant, scarcely 1 line long, obtuse, glabrous. Outer glume very short, broad, truncate, nerveless; 2nd and 3rd glumes equal, 3- or 5-nerved, both empty. Fruiting glume smooth and shining.—F. Muell. *Fragm.* viii. 193.

Queensland. Brisbane River, Moreton Bay, *F. Mueller, Bailey*; Cleveland Bay, *Gulliver*; South Queensland, *Hartmann*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Mrs. Calvert* and others; Ash Island, *Scott*.

42. ***P. trichoides*, Sw.; Kunth, Enum. i. 112.**—Decumbent at the base and often shortly creeping and rooting, though sometimes apparently annual, the stems slender, ascending to from 6 in. to nearly 1 ft. Leaves ovate-lanceolate or rarely narrow, cordate and ciliate at the base, the sheaths also often slightly hairy. Panicle at first sessile within the last leaf, but at length pedunculate, decomposed with numerous capillary flexuose divided spreading branches, the lower ones clustered, the whole panicle ovate in outline 2 to 4 in. long, and often almost as broad, glabrous, or with a few long hairs scattered on the main rhachis. Spikelets almost the smallest in the genus, ovoid, obtuse, scarcely more than $\frac{1}{2}$ line long. Outer glume scarcely $\frac{1}{2}$ the length of the spikelet, ovate, acute, 1-nerved; 2nd and 3rd nearly equal, broadly ovate, 3-nerved, shortly hirsute; a small palea sometimes but not always in the 3rd. Fruiting glume smooth and shining.

N. Australia. Port Darwin, *Schultz, n. 264*.

Queensland. Daintree River, *Fitzalan*.

P. minutum, R. Br. *Prod.* 191, from Endeavour River, *Banks and Solander*, is founded upon a very small slender annual of 2 or 3 in. including the panicle, which appears to be an accidentally small depauperated state of *P. trichoides*.

43. ***P. hermaphroditum*, Steud. Syn. Glum. i. 67.**—Stems creeping and rooting at the base, ascending to 1 ft. or more, rather slender. Leaves spreading, lanceolate or almost linear, sprinkled especially the lower ones with rather long hairs. Panicle narrow, rather dense, $1\frac{1}{2}$ to 3 in. long, the short capillary branches much divided, with few or many long hairs on the rhachis and branches. Spikelets very numerous, all pedicellate, usually of a dark brown, obliquely ovoid, under $\frac{3}{4}$ line long and broad. Empty glumes all broad and 3-nerved, the outer one more than $\frac{1}{2}$ the length of the spikelets, the 2nd very broad and gibbous, the 3rd rather longer and straight. Fruiting glume very hard and smooth, broad and very gibbous. Palea also hard and smooth, projecting laterally from the glume more than in any other species.—*P. pilipes*, Nees in *Pl. Wight*, Exs. n. 2343.

Queensland. Daintree River, *Fitzalan*.

This species, which is also in Ceylon, the East Indian Peninsula and the Malayan Archipelago, appears to me to be quite distinct from the *P. trigonum*, Retz, with which it is united in Thw. *Enum.* 359.

44. ***P. marginatum*, R. Br. Prod. 190.**—A rather slender but often rigid grass, decumbent branching and often rooting at the base,

ascending to 1 ft. or more, glabrous except the cilia at the orifice of the sheaths, and the rachis of the inflorescence often slightly pubescent. Leaves flat, usually narrow, but exceedingly variable in size. Panicle narrow, in the typical form $1\frac{1}{2}$ to 3 in. long, of few erect or scarcely spreading simple or slightly divided branches. Spikelets irregularly crowded along the branches or sometimes almost in a single row, ovoid, obtuse or scarcely acute, about $1\frac{1}{4}$ lines long. Outer glume very thin, not $\frac{1}{2}$ the length of the spikelet, 1-nerved or faintly 3-nerved; 2nd and 3rd glumes nearly equal and similar, both empty, membranous, 3- or 5-nerved, glabrous. Fruiting glume rather shorter, slightly hardened and densely silky-pubescent or villous as well as the exposed part of the palea.—Trin. Spec. Gram. ii. t. 209; F. Muell. Fragm. viii. 190; Sieb. Agrostoth. n. 69.

Queensland. Wide and Moreton Bays, *F. Mueller*, *Leichhardt* and others; Rockhampton, *O' Shanesy*.

N. S. Wales. Port Jackson, *R. Brown* and others; Hunter's River, *R. Brown*; New England, *C. Stuart*; Macleay River, *Beckler*; Hastings River, *C. Moore*.

Victoria. Various localities in eastern Gipps' Land, *F. Mueller*.

Var. majus. Stems tall, with broad leaves 6 in. long, the lower branches of the panicle 3 or 4 in. and the spikelets above $1\frac{1}{4}$ lines long.—Queensland, chiefly in *Leichhardt's* collections.

Var. strictum. Stems slender, rigid, much branched, with very short narrow leaves, the panicle narrow, very little branched, and sometimes reduced to a simple interrupted spike.—*P. strictum*, *R. Br. Prod.* 190; *Trin. Spec. Gram.* ii. t. 179; *Sieb. Agrostoth.* n. 71 and 90.—Port Jackson, *R. Brown* and others.

Amidst all its varieties which it sometimes seems difficult to unite, this species is readily known by the dense pubescence of the fruiting glume which has not been observed in any other *Panicum*. Some specimens seem to show that the *P. strictum* is rather an after-growth from plants that have been cut down, than a distinct variety. The *P. singulare*, *Steud. Syn. Glum.* i. 60, from the character given, must be referable to the same species.

45. *P. lachnophyllum*, Benth.—A low decumbent grass, with ascending branches of 6 to 8 in. Leaves very spreading, rather rigid, acute, softly pubescent on both sides, the sheaths softly villous, the ligula reduced to cilia. Panicle narrow, erect, not much branched, 1 to 2 in. long. Spikelets very shortly pedicellate or almost sessile, ovoid, obtuse, rather under 1 line long. Outer glume small, ovate, rather acute, 2nd and 3rd glumes nearly equal, membranous, 5-nerved, both empty. Fruiting glume smooth and shining, but tipped with a slight pubescence.

Queensland. Moreton Bay, *C. Stuart*. *F. Mueller* thinks that this may be a variety of *P. marginatum*, but besides a difference in habit and the pubescence of the leaves, the spikelets are much smaller and the fruiting glumes quite glabrous except at the tip.

46. *P. obseptum*, Trin. Gram. Panic. Diss. ii. 149.—A weak glabrous grass, decumbent at the base or creeping in the mud and shortly ascending. Leaves narrow, the ligula a ring of cilia. Panicle narrow and loose, 1 to 2 in. long, of few simple or scarcely divided

branches. Spikelets few, all pedicellate, the upper ones of each primary branch solitary, the lower ones 2 or 3 together on short secondary branches, all narrow-ovoid, 1 to $1\frac{1}{2}$ lines long, quite glabrous, rather obtuse. Outer glume short, broad, nerveless, truncate or shortly acute, the 2nd and 3rd equal or nearly so, membranous, 5-nerved, both empty. Fruiting glume rather acute, smooth and shining.

N. S. Wales. Borders of ponds, Port Jackson and Richmond, *Woolfs*; New England, *C. Stuart*.

The shape of the spikelets and glumes would suggest that this might be a very reduced form of *P. decompositum*, but none of the rather numerous specimens show any tendency to a further development and there is no vestige of a palea in the 3rd glume. It is doubtfully referred by F. Mueller, *Fragm.* viii. 195, to *P. hygrocharis*, Steud., an Abyssinian plant named *P. paludosum* by Hochstetter and published as *P. aquaticum* by A. Richard, but that is the common *P. repens*, readily known amongst other characters by the male flower in the 3rd glume. I have not seen the typical specimen received by Trinius from Lindley as from Port Jackson, but the description given by Trinius, as well as that of Nees in *Mart. Fl. Bras. ii.* 113, taken from the same specimen, leave no doubt as to its identity.

47. *P. Buncei*, F. Muell. Herb.—A glabrous perennial of 1 to 2 ft. Leaves long and narrow, the ligula prominent, bordered by a few long cilia. Panicle narrow, rather loose, not much branched, 3 to 4 in. long, the branches filiform and flexuose. Spikelets several along the smaller branches, rather acute, nearly 2 lines long. Outer glume broad and loose, thin, almost truncate but 1- or 3-nerved, $\frac{1}{4}$ or $\frac{1}{3}$ the length of the spikelet; 2nd and 3rd glumes nearly equal, membranous, 5- or 7-nerved, glabrous, the 3rd rather longer than the 2nd, with a broad acuminate rather rigid palea, but no stamens in any of the spikelets examined. Fruiting glume obtuse, about $\frac{1}{2}$ the length of the outer ones, smooth and shining.

Queensland. Bokhara Flats, *Leichhardt*.—I have some hesitation in proposing this species, which has much the aspect of a few specimens of *P. repens*, but there appears to be no male flower in the 3rd glume which I have invariably found in *P. repens*.

48. *P. bicolor*, R. Br. Prod. 191.—Usually a small slender tufted grass, with much the habit of some species of *Aira* or *Agrostis*, but sometimes above 1 ft. high, approaching in habit the *P. melananthum*. Leaves linear, usually very narrow, more or less hairy especially at the orifice of the sheath, rarely quite glabrous, the ligula very short, ciliate. Panicle usually only 2 or 3 in. long, loose and slender but rather narrow, but sometimes larger and spreading, the branches capillary and flexuose, not clustered and not much divided. Spikelets all pedicellate, about 1 line long, glabrous. Outer glume acute, 3-nerved, fully $\frac{1}{2}$ as long as the spikelet; 2nd and 3rd glumes nearly equal, acute, about 5-nerved, the 3rd with a palea but no stamens. Fruiting glume smooth and shining.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *Bailey*; Rockhampton, *O'Shunesy*; Herbert's Creek, *Bowman*.

N. S. Wales. Port Jackson, *R. Brown, Woolis*; Maneroo, *M. s. Calvert*; New England, *C. Stuart*; Archer's Station, *Leichhardt*.

49. **P. melananthum**, *F. Muell. in Trans. Vict. Inst.* 1855, 47.—A glabrous grass of 2 ft. or more, decumbent at the base and perhaps annual. Leaves flat and rather broad, the ligula exceedingly short, ciliate. Panicle sessile or nearly so within the last leaf, large and loose, with very numerous much divided capillary branches, scattered along the main rhachis and very rarely clustered. Spikelets all pedicellate, about 1 line long, acute, glabrous, often dark-coloured. Outer glume ovate, acute, 1- or sometimes 3-nerved, nearly $\frac{1}{2}$ the length of the spikelet; 2nd and 3rd glumes nearly equal, acute, rather broad, membranous, with usually 5 not prominent nerves, the 3rd quite empty without any palea. Fruiting glume smooth and shining.

Queensland. Brisbane River, Moreton Bay, *F. Mueller, Bailey*.

N. S. Wales. New England, *C. Stuart*; Clarence River, *Wilcox*.

Victoria. Hume, King and Ovens Rivers, *F. Mueller*.

F. Mueller (Fragm. viii, 192) refers this to *P. coloratum* Linn., a species founded on a garden plant which is apparently not distinct from *P. repens*.

P. miliaceum, Linn., a species very much cultivated in the Mediterranean region under the name of 'Little Millet' as well as in several hot countries, has been found in South Australia as an escape from cultivation (*F. Mueller*). It is an erect annual of about 2 ft., with rather broad hairy leaves and a much divided nodding panicle. Spikelets numerous, pedicellate, ovoid, about 2 lines long, the outer glume acute, 3-nerved, above half as long as the broad membranous 7- to 11-nerved 2nd and 3rd glumes. Fruiting glume smooth and shining.

50. **P. effusum**, *R. Br. Prod.* 191.—An erect perennial, our specimens mostly under 1 ft. but said to attain 2 ft. Leaves lanceolate or linear-lanceolate, scabrous and hairy as well as the sheaths, the nodes bearded with long spreading hairs; ligula very short and ciliate. Panicle much-branched, sessile within the last leaf, 3 to 4 in. long when first in flower, at length twice as long, the filiform divided branches very spreading and flexuose, the lower ones densely clustered but not verticillate, the upper ones scattered and distant. Spikelets all pedicellate, acute, about 1 line long, glabrous. Outer glume acute, 1- to 3-nerved, about $\frac{1}{2}$ the length of the spikelet or rather more; 2nd and 3rd glumes nearly equal, 5- or 7-nerved, a palea within the 3rd about $\frac{1}{2}$ its length. Fruiting glume smooth and shining.—*Sieb. Agrostoth.* n. 67; *Trin. Spec. Gram.* t. 244.

Queensland. Rockhampton, *Bowman*; and apparently the same, Cape York, *Dæmel*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolis* and others; northward to New England, *C. Stuart*; Macleay River, *Beckler*; and in the interior Nanduruga Creek, *Victorian Expedition*.

Var. *convallium*, less hairy and more or less glaucous.—*P. convallium*; *F. Muell.* in *Trans. Vict. Inst.* 1855, 46.

N. S. Wales. Murray and Darling Rivers, *F. Mueller, Dallachy*.

Victoria. Ballarat, *Bacchus*; Portland Bay, *F. Mueller*.

S. Australia. Gawler Town, Flinders Range, Torrens River, etc., *F. Mueller*; North of Fowler's Bay, *Giles*.

W. Australia. Fraser's Range, *Dempster*.

F. Mueller (Fragm. viii. 191) refers the whole species to the North American *P. capillare*, Gronov., to which it certainly bears some general resemblance, but that species has as far as is known always a male flower in the 3rd glume, which I have never found in the Australian *P. effusum*, besides other minor differences.

51. *P. Mitchelli*, Benth.—An erect grass, decumbent at the base only, 2 to 3 ft. high, nearly allied to *P. effusum*, but larger, quite glabrous and the nodes not bearded. Leaves often long, the short ligula rather jagged than ciliate. Panicle usually very large and spreading with very numerous divided filiform branches, the lower ones clustered and rigid, the upper ones scattered. Spikelets all pedicellate, usually several along the ultimate branches, rather above 1 line long, acutely acuminate, quite glabrous. Outer glume acute, nearly $\frac{1}{2}$ the length of the spikelet, 1- to 3-nerved; 2nd and 3rd glumes nearly equal, acutely acuminate, about 5-nerved, a palea in the 3rd sometimes very small, more frequently above $\frac{1}{2}$ the glume. Fruiting glume smooth and shining.

Queensland. North-east Coast, *A. Cunningham*; Cape York, *Daemel*; Port Curtis, *McGillivray*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*; Warwick, *Beckler*.

N. S. Wales. Bogan River, *Mitchell*; county Campden, Macquarrie and Castle-reagh Rivers, *Woolfs*; Clarence River, *Beckler*.

A smaller glaucous plant with a smaller panicle and rather larger spikelets, from Cooper's Creek, *Howitt's Expedition*, appears to be a variety of this species.

F. Mueller, Fragm. x. 76, mentions *P. incomptum*, Trin., as having been gathered by Dallachy at Rockingham Bay. I have not found among Dallachy's plants in Herb. *F. Muell.* any specimens answering to those we have of *P. incomptum* from the Philippine Islands as well as from E. India, nor any so named by *F. Mueller*, but it is possible he may have intended to include in *P. incomptum* Dallachy's specimens of *P. Mitchelli*, which are allied to it but according to my views quite distinct.

52. *P. decompositum*, R. Br. Prod. 191.—A semi-aquatic glabrous grass, often tall and stout. Leaves mostly long, flat and rather broad especially when growing in water, narrow in drier situations; ligula very short and broad, ciliate. Panicle 6 in. to 1 ft. long or even more, with numerous crowded filiform divided branches, the lower ones clustered, at first erect and enclosed at the base within the last leaf-sheath, at length sometimes very loose and spreading to the breadth of 1 ft. Spikelets all on slender pedicels, narrow, acute, $1\frac{1}{4}$ to $1\frac{1}{2}$ lines long, usually of a pale straw colour. Outer glume very short, broad and truncate, thin and nerveless; 2nd and 3rd glumes nearly equal, acute, thinly membranous, 5- or 7-nerved, the 3rd with a palea from $\frac{1}{4}$ to $\frac{1}{3}$ its length but no stamens. Fruiting glume very smooth and shining.—*P. proliferum*, *F. Muell.* Fragm. viii. 191, not of Lam.; *P. amabile*, Balansa in Bull. Soc. Bot. Fr. xix. 324, at least as to the W. Australian plant referred to; *P. lævinode*, Lindl. in Mitch. Three Exped. i. 238.

N. Australia. Gulf of Carpentaria, *R. Brown*; Victoria and Fitzmaurice Rivers, *F. Mueller*; Cygnet Bay, *A. Cunningham*.

Queensland. Port Curtis, *McGillivray*; Brisbane River, *Bailey*; Flinders River, *Sutherland*; King's Creek, *Bowman*; Peak Downs, *Burkitt*; also in *Leichhardt's* collection.

N. S. Wales. Macleay River, *Beckler*; Russell and Johnston Rivers, *W. Hill*; Darling River, *Mitchell*.

S. or Central Australia. Cooper's Creek, *Howitt*; near Lake Eyre, *Andrews*; Charlotte Waters, *Giles*.

W. Australia, *Drummond*, n. 43 and 957; Murchison River, *Oldfield*.

The species is also common in East India if the *P. paludosum*, Roxb. be really identical, as it appears to be notwithstanding some slight differences in the specimens examined. Some of the narrower-leaved Australian specimens differ also in the rather smaller spikelets with the outer glume not quite so truncate, but all are probably one species. Munro is also of opinion that the North American *P. geniculatum*, Muehl. may be the same, but certainly not the *P. proliferum*, Lam., to which *P. paludosum*, Roxb. has been inadvertently referred by some recent botanists.

53. *P. trachyrhachis*, Benth.—A tall erect stout glabrous plant, nearly allied to *P. decompositum*. Leaves long and narrow, the ligula reduced to a ring of cilia, the nodes glabrous. Panicle large and loose, often 1 to 1½ ft. long, with numerous long slender divided branches, the lower ones usually verticillate, scabrous as well as the rhachis. Spikelets all pedicellate, nearly 1½ lines long. Outer glume often as long as the others, 3- or 5-nerved, tapering into a long point sometimes ciliate at the end; 2nd and 3rd glumes nearly equal, acutely acuminate, 7- or 9-nerved, the 3rd with a palea often nearly as long, but no stamens in any of the specimens examined. Fruiting glume much shorter, obtuse, smooth and shining.

N. Australia. Victoria River, *Elsey*; Port Darwin, *Schultz*, n. 343; Arnhem's Land, *McKinlay*.

Var. *tenuior*. More slender, panicle not so large and less scabrous, and the glumes less acute.

Queensland. Percy Islands, *A. Cunningham*; Brisbane River, *Bailey*; Peak Downs, *F. Mueller*; Springsure, *Wuth*.

F. Mueller, *Fragm.* viii. 192, reduces the species to the North American *P. virgatum*, Linn., which it resembles in some respects, but differs in inflorescence, and the American plant is always described as having a male flower in the 3rd glume, which I also find in all the American specimens I have examined.

54. *P. prolutum*, F. Muell. in Trans. Vict. Inst. 1855, 46.—Stems from a branching base erect, rigid, 1 to 2 ft. high. Leaves rather rigid, the margins involute when dry, glabrous and glaucous; ligula very prominent, scarious, truncate or slightly jagged. Panicle 3 to 6 in. long, of numerous slender divided branches, the lower ones clustered, erect and enclosed at the base by the last sheath or at length exerted and spreading. Spikelets on filiform pedicels ovoid, acute, glabrous, about 1½ lines long. Empty glumes rather rigid, prominently nerved, the outer one obtuse, with scarious margins, more than ½ the length of the spikelet, 3- or 5-nerved, the 2nd and 3rd nearly equal, acute,





5- or 7-nerved, no palea in the 3rd. Fruiting glume smooth and shining.

Queensland. Condamine River, *Hartmann*; Armadillo, *Barton*.

N. S. Wales. Lachlan and Darling Rivers, *Dallachy*, *Burkitt*; Mount Murchison, *Bonny*.

Victoria. Avoca Murrumbidgee and Light Rivers, *F. Mueller*.

S. Australia. Flinders Range, *F. Mueller*.

Munro thinks that the Queensland plant may prove to be distinct from the more southern one. The two, however, must be closely allied and readily distinguished from all others of the group by the much longer ligula not ciliate.

4. OPLISMENUS, Beauv.

(*Orthopogon*, *R. Br.*)

Spikelets with 1 terminal hermaphrodite flower and a rudimentary one below it, awned, clustered along the second distant branches of a simple panicle. Glumes 4, the lowest empty one not much shorter than the others and with a longer awn, the flowering glume awnless and hardened with the palea round the grain as in *Panicum*.

A small tropical and subtropical genus common to the New and the Old World, and very closely allied to some of the awned species of *Panicum*, to which several botanists would restore it. The inflorescence, together with the greater development and long awn of the outer empty glume, may however suffice to retain it as distinct, with the limits originally assigned to it by Beauvois and by Brown. The Australian species are both of them of a very wide distribution.

Lower branches of the panicle $\frac{1}{2}$ to 2 in. long 1. *O. compositus*.

All the branches of the panicle reduced to sessile clusters . . . 2. *O. setarius*.

1. ***O. compositus*, Beauv. Agrostogr. 54.**—Usually a weak grass softly pubescent or villous, but sometimes nearly glabrous. Stems decumbent or creeping and rooting at the base, ascending sometimes to above 1 ft. Leaves from linear-lanceolate to ovate-lanceolate, 4 to 5 in. long in the larger specimens, but more frequently under 2 in. Panicle slender, consisting of 4 to 8 or rarely more distant one-sided branches or spikes, of which the lowest slender ones are 2 in. long in the most luxuriant specimens, scarcely $\frac{1}{2}$ in. long in others, the upper ones or sometimes the greater number reduced to short clusters. Spikelets glabrous pubescent or hirsute, rather above 1 line long, in distinct clusters of 2 or 3 each along the longer branches, crowded on the shorter ones. Glumes 3 lower ones membranous, 5-nerved, the lowest not much shorter than the others tapering into a rather long smooth awn, the 2nd with a small point or short awn, or only acuminate, the 3rd rather larger, awnless, with a small hyaline palea or rudimentary flower in its axil; flowering glume nerveless, smooth and hard as well as the palea round the grain.—*Panicum compositum*, Linn.; Trin. Spec. Gram. ii. t. 187, 188, 190; F. Muell. Fragm. viii. 199; *Orthopogon compositus*, R. Br. Prod. 194.

Queensland. Shoalwater Bay and Broad Sound, *R. Brown*; Cape York, *Dacmel*; Endeavour River, *A. Cunningham*; Goold and Dunk Islands, *McGillivray*; Rockingham Bay, *Dallachy*.

N. S. Wales. *Sieber*, *Agrost.* n. 73; Botany Bay, *Banks and Solander*; Blue Mountains, *Woolfs*; Macleay and Clarence Rivers, *Beckler*.

2. *O. setarius*, *Rœm. and Schult.*; *Kunth*, *Enum.* i. 139.—Very near the slender forms of *O. compositus*, and perhaps rightly included in that species by *F. Mueller*, but the spikes or branches of the panicle are all reduced to single sessile clusters of spikelets, or the lowest rarely slightly elongated into 2 distinct clusters. Leaves always narrow-lanceolate.—*Panicum setarium*, *Lam. Illust.* i. 170.

Queensland. Keppel Bay, *R. Brown*; Moreton Bay, *C. Stuart*.

N. S. Wales. Hunter's River, *R. Brown*; Tweed River, *C. Moore*, *Guilfoyle*; Archer's Creek, *Leichhardt*; Lord Howe's Island, *Fullagar*.

Victoria. Snowy and Broadribb Rivers, *F. Mueller*; Yarra River, *Luckman*.

There are two varieties sometimes distinguished as species; the one softly villous, including the Moreton Bay and Tweed River specimens, is the *Orthopogon æmulus*, *Br. Prod.* 194 (*Oplismenus æmulus*, *Kunth*, *Enum.* i. 142); the other, glabrous or nearly so, comprising the remaining specimens above quoted, includes *Orthopogon flaccidus* and *O. imbecillis*, *R. Br. Prod.* 194 (*Oplismenus flaccidus*, and *O. imbecillis*, *Kunth*, *Enum.* i. 142; *Panicum imbecille*, *Trin. Spec. Gram.* t. 191).

5. SETARIA, Beauv.

Spikelets with 1 terminal hermaphrodite flower and sometimes a second male one below it, crowded in a cylindrical dense or rarely interrupted spikelike panicle, not awned but surrounded by numerous awnlike barren branches, persistent on the main rhachis, the spikelets sessile near the base of the branches and falling away from them. Glumes 4, the outer one small, the 2nd usually shorter than the 3rd. A palea and sometimes 3 stamens in the axil of the 3rd. Terminal or fruiting glume of a firmer consistence, with a perfect flower. Styles distinct. Grain enclosed in the hardened glume and palea, but free from them.

The genus is generally spread over the warmer and temperate regions of the globe. Of the four Australian species three are common weeds over nearly the whole area, the fourth is abundant in America, more rare especially in the typical form in Asia. The genus is by some again reduced to a section of *Panicum* with which it is connected chiefly through the Asiatic *P. enode* and *P. plicatum*.

Fruiting glume transversely rugose., Awnlike panicle-branches scabrous, with erect teeth.

Panicle cylindrical, simple, 1 to 1½ in. long, the spikelets solitary at the base of the awnlike branches 1. *S. glauca*.

Panicle dense or interrupted, 3 to 8 in. long, the spikelets clustered near the base of the awnlike branches 2. *S. macrostachya*.

Fruiting glume smooth. Spikelets more or less clustered.

Awnlike panicle-branches scabrous with erect teeth 3. *S. viridis*.

Awnlike panicle-branches scabrous with reversed teeth 4. *S. verticillata*

1. *S. glauca*, *Beauv.*; *Kunth*, *Enum.* i. 149.—An erect annual, of a pale green, 1 to 2 ft. high. Leaves flat, with scabrous edges and



often ciliate with a few long hairs. Spikelike panicle simple, cylindrical, 1 to $1\frac{1}{2}$ in. long, the spikelets solitary at the base of numerous awnlike branches, many of which are barren and all scabrous with minute teeth directed upwards. Spikelets ovoid, about $1\frac{1}{2}$ lines long. Outer glume very small, the 2nd not quite so long as the 3rd. A palea and very rarely stamens in the 3rd. Fruiting glume more or less gibbous, marked with prominent transverse wrinkles.—Reichb. Ic. Fl. Germ. t. 47; *Panicum glaucum*, Linn.; Trin. Spec. Gram. t. 195; *ennisetum glaucum*, R. Br. Prod. 195; F. Muell. Fragm. viii. 110.

N. Australia and Queensland, R. Brown, and sent by various collectors from numerous localities.

N. S. Wales. Port Jackson to the Blue Mountains, R. Brown and others; and in the interior, A. Cunningham and others.

Victoria. Goulburn River, F. Mueller.

Central Australia, Gosse.

A common weed in the Old World and some parts of America, said by Döll and others to be replaced in Brazil by the *S. imberbis*, R. and S. which, however it seems difficult to distinguish specifically in America any more than in the Old World.

2. **S. macrostachya**, H. B. and K. Nov. Gen. et Sp. i. 110.—

Much taller and stouter than *S. glauca*. Leaves long, flat, often above $\frac{1}{2}$ in. broad, the ligula short, ciliate, otherwise quite glabrous in the typical form. Spikelike panicle 3 to 8 in. long, compound, usually very compact and cylindrical or the lower branches longer. Spikelets numerous on the lower branches, few on the upper ones, in dense clusters more or less interspersed with awnlike barren branches, ovoid, acute, fully $1\frac{1}{2}$ lines long, glabrous. Outer glume about $\frac{1}{2}$ the length of the spikelet, the 2nd shorter than the 3rd but variable in proportion, all membranous with prominent nerves. Fruiting glume often oblique or gibbous, always marked with prominent transverse wrinkles as in *S. glauca*.—*Panicum macrostachyum*, Nees; *Pennisetum italicum*, R. Br. Prod. 195; F. Muell. Fragm. viii. 110, but not the *Panicum italicum*, Linn.

Queensland. Endeavour River, Banks and Solander; Port Denison, Fitzalan; Herbert's Creek, Bowman; Rockhampton, O'Shanesy; Brisbane and Gilbert Rivers, F. Mueller, and other localities in south Queensland from various collectors.

N. S. Wales. Clarence River, Wilcox.

The species is common in many parts of tropical America in a form corresponding to the usual Australian one; from East India we have but few specimens of a more slender variety with interrupted spikelike panicles. The West Indian *S. setosa*, Roem. and Schult., or *Panicum setosum*, Sw. Trin. Spec. Gram. t. 95, 96, has been also referred to it, although it has generally a looser and narrower panicle. The *S. italica*, so much cultivated in some parts of Asia and of the Mediterranean region, is a very different species, readily known by its small nearly globular spikelets with smooth fruiting glumes.

Var. ? *Schultzii*. Stems more slender. Leaves sprinkled with rigid hairs. Panicle long, narrow, slender and interrupted.—*Pennisetum Swartzii*, F. Muell. Fragm. viii. 110.

N. Australia Port Darwin, Schultz, n. 272. With the habit nearly of the typical *S. setosa*, this may prove to be a distinct species.

3. *S. viridis*, Beauv.; Kunth, *Enum.* i. 151.—An annual with the habit of the *S. glauca*, but the spikelike panicle looser, 1 to 2 in. long in the typical form, but occasionally nearly twice that, the lower spikelets in distinct clusters or on short branches, the awnlike branches more irregular and often shorter, the asperities directed upwards as in *S. glauca*. Outer glume acute, about $\frac{1}{2}$ the length of the spikelet; 2nd and 3rd glumes nearly equal, broad, concave, 5- or 7-nerved. Fruiting glumes smooth and shining, the minute transverse wrinkles visible only under a lens.—Reichb. Ic. Fl. Germ. t. 47; *Panicum viride*, Linn.; Trin. Spec. Gram. t. 203; *Pennisetum viride*, R. Br. Prod. 195.

N. Australia. Dampier's Archipelago, *A. Cunningham* (an exceptional form with spikes 3 to 4 in. long).

Central Australia. McDonnell Range, *Giles*.

W. Australia, *Drummond*.

Widely spread as a weed in many parts of the Old World, but not so common as *S. glauca* and *S. verticillata*.

4. *S. verticillata*, Beauv.; Kunth, *Enum.* i. 152.—An annual with the habit of *S. glauca* and *S. viridis*. Spikelike panicle 1 to 3 in. long, often rather loose and interrupted at the base, the spikelets densely clustered at the base of the branches, and the awnlike barren branches very adhesive, with the asperities or teeth directed downwards, not upwards as in other *Setariæ*. Spikelets scarcely above 1 line long. Outer glume about $\frac{1}{2}$ the length of the spikelet; 2nd glume nearly as long as the 3rd, broad, about 7-nerved. Fruiting glume smooth and shining, the minute transverse wrinkles visible only under a lens.—Reichb. Ic. Fl. Germ. t. 47; *Panicum verticillatum*, Linn.; Trin. Spec. Gram. t. 202; *Pennisetum verticillatum*, R. Br. Prod. 195; F. Muell. Fragm. viii. 110.

N. Australia. Dampier's Archipelago and Nichol Bay, *Walcot*.

W. Australia, *Drummond*.

A common weed of cultivation in warm and temperate countries, in many places probably of modern introduction.

6. PLAGIOSETUM, Benth.

Spikelets 1-flowered, usually solitary between the barren branches of partial panicles or involucre, not awned, the involucre few and distant along the rachis of a simple panicle and falling off with the spikelets, the branches few with unilateral bristle-like branchlets, rarely bearing a second spikelet. Glumes 4, the outer one short, the 2nd and 3rd empty. Styles distinct. Nut enclosed in the hardened fruiting glume and palea.

The genus is limited to a single species, endemic in Australia, allied to *Setaria* and *Pennisetum*, but with the involucre very different from either.

1. *P. refractum*, Benth. in Hook. Ic. Pl. t. 1242—Apparently an-









nual, much branched, 6 in. to 1 ft. high, glabrous, leafy in the lower part, the leaves narrow. Involucres few, distant along a simple terminal leafless rhachis, all pedunculate, the peduncles spreading or reflexed, 3 to 5 lines long, articulate at the base and falling off with the involucre and spikelet. Involucre not completely surrounding the spikelet, about $\frac{1}{2}$ in. long, the bristles not plumose, united at the base into 3 or 4 slightly flattened branches with the minor branches or bristles along their inner face, the main branch continuing the peduncle. Spikelet usually solitary on a short thick pedicel between the branches, narrow, somewhat acuminate, about 3 lines long. Outer glume $\frac{1}{2}$ the length of the spikelet or rather more; 2nd and 3rd glumes both empty equal and many-nerved. Fruiting glume hard, apparently smooth and shining but minutely rugose under a lens.—*Setaria refracta*, F. Muell. Fragm. iii. 147; *Pennisetum refractum*, F. Muell. Fragm. viii. 109.

Central Australia. Cooper's Creek, *Howitt's Expedition*; Alice Springs, *Giles*. Occasionally but rarely the principal branch of the involucre is rather more flattened and ends in a second spikelet, but the articulation is below the involucre as in *Pennisetum*, not under each spikelet as in *Setaria*.

7. PENNISETUM, Rich.

(*Gymnothrix*, Beauv.)

Spikelets 1-flowered, solitary or 2 or 3 together, sessile or nearly so, each one enclosed in an involucre of several usually numerous simple or plumose bristles (probably awnlike branches of the panicle), the involucre crowded in a spike or spikelike simple panicle, falling off from the main rhachis with the spikelet and short peduncle. Glumes 4, the outer one shorter or sometimes minute, the 2nd and 3rd both empty. Fruiting glume usually smaller. Palea perfect. Styles distinct or united almost to the plumose stigmas. Nut enclosed in the more or less hardened glume and palea, free from it.

The genus is spread over the tropical regions of the Old World with a few American species. Of the two Australian species, one is very close to if not identical with a Chinese and Japanese one, the other is endemic. They would, according to the views of some modern botanists, be placed in two different genera, founded on the nature of the involucre, and neither belong to the typical form with the inner bristles plumose and the outer ones simple.

Involucral bristles numerous, all simple, surrounding the spikelet in several rows	1. <i>P. compressum</i> .
Involucral bristles 6 to 10, all plumose at the base, closely surrounding the spikelet	2. <i>P. arnhemicum</i> .

1. ***P. compressum***, R. Br. *Prod.* 195.—Stems 2 to 3 ft. high, erect, usually very scabrous and more or less hirsute under the panicle, glabrous and smooth lower down. Leaves long and narrow, glabrous, the ligula prominent. Involucres nearly sessile in a simple cylindrical dense spike of 3 to 6 in., consisting of numerous very unequal bristles, the inner more rigid ones varying from $\frac{1}{2}$ to 1 in., the outer ones much shorter and finer, mostly minutely scabrous-ciliate but none of them

plumose. Spikelet solitary within the involucre, narrow, terete, rather acute, about 3 lines long. Outer glume under $\frac{1}{2}$ line long, orbicular, 2nd glume from $\frac{1}{3}$ to $\frac{1}{2}$ the length of the spikelet, the 3rd many-nerved, empty. Fruiting glume scarcely more rigid than the 3rd. Styles united up to the feathery branches.—F. Muell. *Fragm.* viii. 110; *Setaria compressa*, Kunth, *Enum.* i. 150; *Gymnothrix compressa*, Brongn. in Duperr. *Voy. Bot.* 103, t. 9.

Queensland. Brisbane River, Moreton Bay, F. Mueller; *Leichhardt* and others; Rockhampton and neighbourhood district, *Thozst* and others.

N. S. Wales. Port Jackson to the Blue Mountains, R. Brown, A. Cunningham, *Wool* and others; New England, C. Stuart; Richmond River, Mrs. Hodgkinson.

P. japonicum, Trin. *Spec. Gram.* t. 19 (*Gymnothrix japonica*, Kunth, *Enum.* i. 158). from China, Japan, and perhaps from Burmah, is closely allied to if not identical with *P. compressum*, although the outer glumes are generally longer in proportion, and the whole spike usually but not always larger.

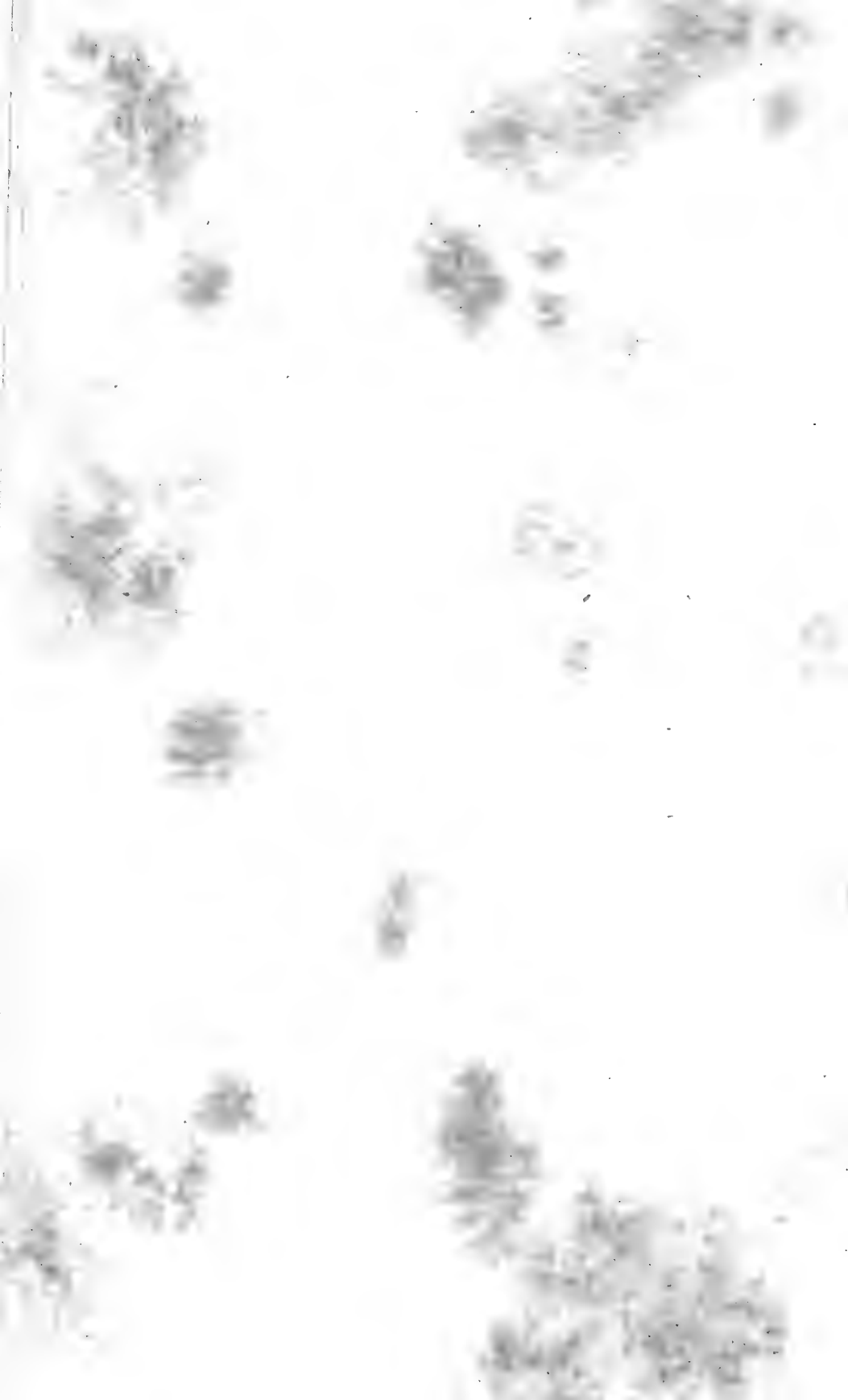
2. *P. arnhemicum*, F. Muell. *Fragm.* viii. 109.—Stems erect. Leaves narrow, rather rigid, glabrous and glaucous, the ligula very short, split into cilia. Spike rather dense, about 4 in. long, appearing woolly from the plumose bristles. Involucres almost sessile, of 6 to 10 unequal bristles, the longest about $\frac{1}{2}$ in. long, all very densely woolly-plumose with long soft white hairs. Spikelet solitary, shortly pedicellate within the involucre, about 2 lines long, quite concealed in the wool. Outer glume about $\frac{1}{3}$ the length of the spikelet, 2nd and 3rd glumes nearly equal, both empty and about 7-nerved. Fruiting glume shorter, hard, smooth and shining. Styles separate to the base or nearly so.

N. Australia. Upper Victoria River, F. Mueller. Allied to the African *P. lanuginosum*, Hochst., but the bristles more numerous, rigid and longer, and the spikelets rather longer.

8. *CENCHRUS*, Linn.

Spikelets with 1 terminal hermaphrodite flower and sometimes a male one below it, not awned, singly or 2 or 3 together within an ovoid or globular involucre of numerous bristles, the inner ones usually broad and flattened, connected at the base and hardened round the fruit, the involucres sessile or pedicellate in a simple spike or raceme and falling off with the spikelets. Glumes 4, the outer one much smaller, sometimes minute, the 2nd and 3rd nearly equal or the 2nd shorter; a palea and sometimes 3 stamens in the 3rd. Fruiting glume more rigid than the others but not so much hardened as in *Panicum*. Styles usually very shortly united at the base. Nut enclosed in the fruiting glume and palea, free from them.





The genus is spread over the warmer regions of both the New and the Old World. The Australian species are all endemic, although one of them differs but very little from a New Caledonian and Polynesian one.

- Leaves glabrous. Involucres under 4 lines long, the inner bristles or lobes plumose at the base. Spikelets solitary 1. *C. australis*,
 Leaves glabrous. Involucre under 4 lines long, the inner bristles or lobes lanceolate, not ciliate, inflexed when in fruit 2. *C. inflexus*.
 Leaves softly villous. Involucres 5 lines long, the inner bristles or lobes shortly ciliate. Spikelets usually 3 3. *C. clymoides*.

1. ***C. australis*, R. Br. Prod. 196.**—A stout glabrous grass, attaining 6 to 9 ft. Leaves long and flat; ligula split into cilia. Spike rather dense, 4 to 8 in. long, the rhachis slightly scabrous-pubescent. Involucres very shortly pedicellate, erect or at length reflexed, broadly ovoid, under 4 lines long, the inner bristles or lobes about 10, flattened and very shortly united at the base, plumose in the lower half, scabrous in the upper part with reversed asperities, one sometimes but not frequently longer than the others; outer bristles numerous, unequal, subulate and scabrous from the base. Spikelets (always?) solitary in the involucre and shorter than the inner lobes. Outer glume short, obtuse, hyaline, nerveless, 2nd glume acute, 3- or 5-nerved, 3rd rather longer, 5-nerved, with a palea and sometimes a male flower in its axil. Fruiting glume as long.—Sieb. Agrostoth. n. 53; *C. echinatus*, var. Trin. in Mem. Acad. Petersb. ser. 6, iii. 173.

Queensland. Northumberland Islands, *R. Brown*; Brisbane River, Moreton Bay, *F. Mueller*, *Bailey*; Rockhampton and neighbouring districts, *Bowman*, *O'Shanesy* and others.

N. S. Wales. George's Head, *R. Brown*; Port Jackson to the Blue Mountains, *Woods*, *C. Moore*, and others; Macleay and Clarence Rivers, *Beckler*, *Wilcox*; Richmond River, *C. Moore*; New England, *C. Stuart*.

Very near the *C. calyculatus*, Cav. (*C. anomoplexis*, Labill.) from the South Sea Islands and New Caledonia, which however seems to differ in the larger involucre enclosing frequently 2 spikelets, in the outer glume much longer and more acute and other minor differences. Both species vary in the one inner bristle much longer than the others or not exceeding them.

2. ***C. inflexus*, R. Br. Prod. 195.**—A tall glabrous grass, resembling *C. australis* in foliage. Spike more dense in the specimens seen, 2 to 2½ in. long, close above the last leaf. Involucres sessile or nearly so, about the size of those of *C. australis* but rather broader and shorter; inner lobes 6 to 8, narrow-lanceolate, rigid, not ciliate but slightly pubescent on the back, inflexed over the fruit, the outer bristles as in *C. australis*. Spikelets solitary according to *R. Brown*, but in one of the two involucre I opened I found 2, in the other 3, all in seed. Glumes rather acute, the 2nd and 3rd 5-nerved, all membranous enclosing the grain.

N. Australia. Arnhem N. Bay, *R. Brown*.

3. *C. elymoides*, *F. Muell. Fragm.* viii. 107.—An erect grass of several feet. Leaves flat or convolute, often very long, the sheaths and under surface villous with soft hairs. Spike 4 to 6 in. long. Involucres sessile, about 5 lines long, close together or rather distant along the flexuose rhachis. Inner bristles or lobes about 8, flat, shortly ciliate, not inflexed; outer ones shorter, rather numerous, subulate, one narrow inner one awnlike and at least twice as long as the others, all scabrous with asperities turned upwards. Spikelets usually 3. Outer glume very short and hyaline; 2nd glume nearly as long as the 3rd. A male flower in the 3rd glume of the central spikelet, often a palea only in the lateral spikelets. Terminal or fruiting glume enclosing a hermaphrodite or female flower, or sometimes only a male flower in the lateral spikelets.

N. Australia. Sturt's Creek, *F. Mueller*; Port Darwin, *Schultz*, n. 59, 193.

Queensland. Cape York, *Daemel*.

9. CHAMÆRAPHIS, R. Br.

Spikelets with 1 terminal flower usually female by abortion and a male one below it, few and distant or solitary on the filiform branches of a simple panicle, the partial rhachis produced into a long awnlike point beyond the insertion of the upper or only spikelet. Glumes 4, the outer empty one very small, the 2nd and 3rd nearly equal, membranous or at length rigid, many-nerved, often tapering to a point but not awned, the 3rd with a palea and 3 stamens in its axil, the 4th or fruiting glume shorter and very faintly nerved. Palea with inflected margins but not auriculate. Staminodia usually 2, very slender, with small abortive anthers. Styles very shortly united at the base. Grain enclosed in the scarious or rather rigid fruiting glume and palea, but free from them.—Semi-aquatic grasses, glabrous or nearly so. Leaves flat, the ligula short.

Besides the three Australian species, one of which extends over tropical Asia, there is one other closely allied to it in Ceylon and the Indian Peninsula. The tropical American *Paratheria prostrata*, Griseb. (*Panicum leptachyrium*, Döll. in Mart. Fl. Bras. ii. part ii. 150, t. 25) is very closely allied to *Chameraphis* and has the same peculiar inflorescence, but the internal structure of the spikelets may be sufficiently distinct to justify the retaining it as a separate genus.

Panicle spreading, with distant spikelets on filiform branches.

Fruiting glume short and obtuse

1. *C. spinescens*.

Panicle spike-like but loose, the spikelets often 2 together on the lower branches. Fruiting glume acute. Outer glume $\frac{1}{2}$ line long, membranous

2. *C. paradoxa*.

Panicle spike-like and close, the spikelets all solitary at the base of the long awnlike branches. Fruiting glume acuminate. Outer glume scarcely prominent, callous and truncate

3. *C. hordeacea*.

1. *C. spinescens*, *Poir. Dict. Suppl.* ii. 189.—Stems creeping at



the base and when in water forming large floating masses. Leaves linear-lanceolate, flat, with loose flattened sheaths, quite smooth or slightly scabrous. Panicle 2 to 4 in. long, with rather numerous filiform flexuose spreading branches produced beyond the last spikelet into an awnlike point always longer than the spikelet. Spikelets few on each branch, distant, shortly pedicellate but closely appressed in each bend of the rhachis, the pedicels and rhachis usually minutely scabrous-ciliate, the spikelet very narrow, about 3 lines long in the typical form. Outer glume about $\frac{1}{2}$ line long, thinly membranous, the 2nd many-nerved, tapering to a long point, the 3rd usually rather smaller with a shorter point and fewer nerves, enclosing the male flower, the fruiting glume much shorter, obtuse, very thin, and remaining thin as well as the palea over the grain, which readily falls out of them.—*C. aspera*, Nees in Wall. Cat. Herb. Ind. n. 8679; *Panicum spinescens*, R. Br. Prod. 193.

Queensland. Moreton Bay, *F. Mueller*; East Australian lagoons, *Leichhardt*.

N. S. Wales. Port Jackson, *R. Brown*; Blue Mountains, *Woolfs*.

Victoria. Lower Mitta-Mitta and Broken Rivers, *F. Mueller*.

Var. *parvispicula*, differing only in the much smaller spikelets.—*Panicum abortivum*, R. Br. Prod. 193; *Chamæraphis abortiva*, Poir. Dict. Suppl. ii. 189.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; between the Norman and Gilbert Rivers, *Gulliver*.

Queensland. Rockingham Bay, *Dallachy*.

The species is generally spread over East India from Ceylon and the Peninsula to the Malayan Archipelago and South China.

2. ***C. paradoxa*, Poir. Dict. Suppl. ii. 189.**—A smaller plant than *C. spinescens*. Leaves mostly short and spreading. Panicle almost reduced to a simple spikelike raceme, the awnlike branches mostly bearing only a single spikelet near the base, the lower ones only occasionally more elongated with two distant spikelets, the rhachis always produced into a long awn exceeding the spikelet. Spikelets acuminate, $\frac{1}{2}$ to 5 lines long. Outer glume broad, thinly membranous, about $\frac{1}{2}$ line long, the 2nd and 3rd glumes nearly equal, striate with many nerves; fruiting glume oblong, acute, nearly 2 lines long, thin and almost nerveless.—*Panicum paradoxum*, R. Br. Prod. 193; Kunth, Rev. Gram. t. 32; Gaudich. in Freyc. Voy. Bot. t. 24.

N. S. Wales. Confluence of the Nepean and Grose Rivers, *R. Brown*; Manly Swamps, *Woolfs*.

Victoria. Swamps between Snowy River and Lake King, *F. Mueller*.

3. ***C. hordeacea*, R. Br. Prod. 194.**—Stems $1\frac{1}{2}$ ft. long. Leaves flat, longer than in *C. spinescens*, glabrous or nearly so. Panicle dense and spikelike, cylindrical, about $1\frac{1}{2}$ in. long, much narrower than in *C. paradoxa*, the branches bearing each a single spikelet very near the base but produced into a capillary awn often 1 to 2 in. long, giving the spike a very barley-like aspect. Spikelets cylindrical, 3 to $\frac{1}{2}$ lines long,

surrounded by a few hairs at the base. Outer glume exceedingly short, callous and truncate, 2nd and 3rd nearly equal, many-nerved, narrower and more rigid than in *C. paradoxa*.—Kunth, Rev. Gram. i. 249, t. 36; *Panicum chamæraphis*, Trin. in Mem. Acad. Petersb. ser. 6, iii. 217.

N. Australia. Islands off the North Coast, *R. Brown*. The three styles observed by *R. Brown* must have been in an exceptionally abnormal flower. In the spikelets examined by Kunth, as well as in two I have examined from *R. Brown*'s specimens, there were but two. I have seen the species in no other collection.

10. STENOTAPHRUM, Trin.

(*Diastemanthe*, Steud.)

Spikelets with 1 terminal hermaphrodite flower and a male or imperfect one below it, usually 2 to 4 together in very short spikes embedded in the alternate notches of the broad rhachis of a spikelike panicle, the rhachis of the partial spike usually produced into a short point beyond the insertion of the spikelets, and the common rhachis often disarticulating transversely between the notches when old. Glumes 4, the lowest empty and very small, the 2nd empty and the largest, membranous but rigid, 3- or 5-nerved, the 3rd and 4th flowering, rather smaller, with the nerves less prominent and of a somewhat firmer texture. Palea within both glumes of a similar consistence. Styles distinct. Grain enclosed in the rather rigid but thin palea and flowering glume and free from them.

A small genus dispersed over the tropical and sub-tropical regions of the New and the Old World. The only Australian species is a widely spread one, chiefly in maritime districts and is believed to have been introduced into Australia.

1. **S. americanum**, Schrank; Kunth, Enum. i. 138.—A glabrous rather coarse grass creeping and rooting at the base, ascending to about 1 ft., the stems somewhat flattened. Leaves obtuse, flat or involute, the sheaths usually broad and flat, ciliate at the orifice. Spikes solitary and terminal, 2 in. long or more, the rhachis flat and flexuose, 1 to 2 lines broad, readily disarticulating transversely between the notches when old, though apparently continuous when in flower. Spikelets 2 or 3 together on very short flat or angular branches in the alternate notches of the common rhachis, the partial rhachis continued beyond the insertion of the uppermost spikelet, but not usually exceeding it, the spikelets sessile, oval-oblong, acute or acuminate, 2 to 2½ lines long, all half immersed in the notches.—F. Muell. Fragm. viii. 156; *S. glabrum*, Trin. Fund. Agrost. 176; *Rottboellia compressa*, Beauv. Agrost. t. 21, f. 8; *Diastemanthe platystachys*, Steud. Syn. Glum. i. 360.

N. Australia. N. W. Coast, *Wickham*; Foul Point, *A. Cunningham*.
Queensland. Wreck Reef, *Denham*; also in *Leichhardt*'s collection.

N. S. Wales. Port Jackson, *U. S. Exploring Expedition*; "an introduced grass, now known as Buffalo grass," *F. Mueller*.

The species is dispersed over the tropical regions both of the New and the Old World, chiefly near the sea.

11. XEROCHLOA, R. Br.

Spikelets with 1 terminal hermaphrodite flower and frequently a male one below it, few in a short simple or branched spike almost enclosed in distant sheathing bracts along the main axis of the panicle, with a bract under each branch or spikelet. Glumes 4, thin, the outer one short, the 2nd longer, the 3rd the longest with a large very prominently 2-nerved palea and often 3 stamens. Terminal flowering glume shorter and very thin. Palea broad, closely enveloping the flower and fruit. Styles united almost up to the rather long plumose stigmas. Grain enclosed in the thin palea, free from it.

The genus is limited to *Australia*.

Spikelets glabrous	1. <i>X. imberbis</i> .
Pedical 2nd glume and palea of the 3rd glume densely bearded, at least in the upper spikelets	2. <i>X. barbata</i> .
Pedical 2nd glume and palea of the 3rd glume densely covered with long intricate woolly hairs	3. <i>X. laniflora</i> .

1. ***X. imberbis*, R. Br. Prod. 197.**—Very closely allied to *X. barbata*, with a similar habit and foliage. The flowering bracts appear to be rather narrower and more distant, more frequently terminating in a point or lamina. Spikes branched, with 5 or 6 spikelets on each branch, but the whole not much exceeding the outer bract. Glumes and paleæ as in *X. barbata*, except that they are all glabrous.—*F. Muell. Fragm. viii. 117.*

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Cygnet Bay, *A. Cunningham*; Victoria River and Sturt's Creek, *F. Mueller*; Port Darwin, *Schultz*, n. 337.

2. ***X. barbata*, R. Br. Prod. 197.**—Stems from a branching base erect, usually about 1 to 2 ft. high. Leaves in the lower part of the plant narrow, almost terete, erect and rigid. Inflorescence occupying the upper part of the plant. Primary bracts rather distant along the simple general rhachis, rather broad and sheathing, about $\frac{1}{2}$ in. long, erect, cartilaginous, produced into a very short obtuse or truncate erect lamina, each enclosing a simple or slightly branched spike of few spikelets often scarcely exceeding the outer bract, each spikelet on a short thick pedicel enclosed in a many-nerved glume-like bract and occasionally interspersed with smaller empty bracts. Spikelets $2\frac{1}{2}$ to 3 lines long; the lower ones glabrous except a few long cilia on the margin of the 2nd glume and the nerves of the palea of the 3rd, the lowest spikelet sometimes barren. In the upper spikelet the pedicel, the nerves of the palea of the male flower and the margins of the 2nd

glume usually densely ciliate or bearded. Grain much shorter than the enveloping palea.—F. Muell. *Fragm.* viii. 117.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Albert River, *Heune*.

3. ***X. laniflora*, Benth.**—More branched and leafy than *X. barbata*, our specimen under 1 ft. high with a short creeping base, with something of the aspect of *Anthistiria membranacea* or of *Apluda mutica*. Sheathing bracts enclosing the spikes several, approximate at the ends of the branches, with one or two lower down and more distant, forming a broad leafy panicle, the bracts less rigid than in *X. barbata*. Structure of the spike and spikelets the same as in *X. barbata*, but the wool of the rhachis short pedicels and base or back of the 2nd glume and of the palea of the male flower very long, dense and intricate, the sheathing and subtending bracts, the protruding ends of the glumes of the fertile flowers and sometimes the lowest spikelet remaining glabrous — *Anthistiria* ? *laniflora*, F. Muell. in *Herb. Hook.*

N. Australia. Sturt's Creek, *F. Mueller*. This is probably the plant alluded to by F. Muell. *Fragm.* viii. 117, as allied to *Neurachne*. The want of the rigid habit which suggested the generic name would make it at first difficult to regard it as a congener, but on examination there appears to be nothing but the habit and the wool of the spikelets to distinguish it.

12. THUAREA, Pers.

(*Microthuarea*, *Beauv.*; *Thouarea*, *Kunth*; *Ornithoccephalochloa*, *Kurz.*)

Spikelets monœcious, in a simple one-sided spike, enclosed in a spatha-like bract, the upper (4 to 6) spikelets with 2 male flowers, the 1 or 2 lower ones with one female or hermaphrodite flower and a rudimentary or male one below it. Glumes 4, the outer one small and hyaline (or sometimes wanting?), flowering ones when perfect with a perfect palea. Styles distinct, slender, with very densely plumose brush-like stigmas. In fruit the bract under the spike falls away, the lower part of the rhachis becomes much dilated, envelops the fruiting spikelet, and is said to bury itself in the sand, the fruiting glume and palea stiffened but scarcely hardened, the grain enclosed but free.

The genus contains only a single species common on sandy sea shores from the Mascarene to the Pacific Islands.

1. ***T. sarmentosa*, Pers. Syn.** i. 110.—Stems creeping and rooting to a great extent, shortly ascending under the inflorescence. Leaves flat, lanceolate, broad or narrow, 1 to 2 in. long, minutely but densely or sometimes sparingly silky-pubescent on both sides. Spike usually about 1 in. long, the spikelets about 2 lines; 2nd and 3rd glumes of the lower fertile one nearly equal, 7- or 9-nerved. Fruiting glume more rigid, but thin and glabrous. In the male spikelets the small outer glume often deficient, the 2nd hairy, the 3rd and 4th rather



longer, glabrous, each enclosing a male flower.—Kunth Revis. Gram. t. 35; *T. latifolia*, *T. media* and *T. involuta*, R. Br. Prod. 198; *Ornithocephalochloa arenicola*, Kurz in Trin. Journ. Bot. iv. (1875), 332, t. 171.

N. Australia. Arnhem North Bay, *R. Brown*.

Queensland. Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*.

There appears to be but one species ranging from Madagascar to the Society Islands. In the more slender specimens, usually minutely and sparingly pubescent but never quite glabrous, there is usually but one fertile spikelet in the spike; in the vigorous very silky ones, such as *Dallachy's* and some from the Friendly Islands, there are usually but not always two.

13. SPINIFEX, Linn.

Spikelets diœcious, spicate or solitary on partial rhachises collected in dense globular heads with a bract under each rhachis. Male plant: Spikelets usually several to each bract, spicate or clustered, 2-flowered. Glumes 4, nearly similar, 2 outer empty ones sometimes smaller sometimes larger than the 2 flowering ones. A perfect palea and 3 stamens within each flowering one. Fertile plant: Spikelets solitary within each bract at the base of a partial rhachis, with one female or hermaphrodite flower and an imperfect or rudimentary or sometimes a male flower below it. Glumes 4 as in the males, the 3rd with a more or less developed palea and sometimes 3 stamens or staminodes. Palea in the 4th glume perfect. Stamens 3, often imperfect. Styles 2, distinct with long shortly plumose stigmas. Grain enclosed in the hardened glume and palea and free from them.—Spreading or creeping hard branching grasses, the flowering branches subtended by leafy or lanceolate and concave bracts.

Besides the three Australian species, of which one extends to the coasts of New Zealand and New Caledonia, there is a fourth very closely allied to one of the Australian ones, widely spread along the sandy sea-shores of tropical Asia.

Heads of spikelets several inches diameter. Male spikelets in spikes of 1 to 1½ in. Females at the base of rigid rhachises of 3 to 4 in.

Plant silky-pubescent or villous 1. *S. hirsutus*.

Plant glabrous 2. *S. longifolius*.

Heads of spikelets not above 1 in. diameter. Male spikelets solitary or clustered within small bracts. Females within broad bracts, the rhachis shorter than the spikelet and sometimes minute or obsolete 3. *S. paradoxus*.

1. ***S. hirsutus*, Labill. Pl. Nov. Holl. ii. 81, t. 230, 231.**—Stem stout, creeping in the sand, forming large tufts. Leaves often above 1 ft. long with involute margins, clothed as well as the whole plant with silky or woolly hairs. Male plant: Spikes sessile or pedunculate, few or many in a terminal head or umbel and often a cluster of 2 or 3 spikes or a single spike lower down on the stem, each spike 1 to 1½ in.

long, the rhachis produced into a point usually exceeding the spikelets and sometimes very long. Bracts under the spikes or peduncles lanceolate, acuminate, concave. Spikelets sessile in the spike or scarcely pedicellate, 5 to 6 lines long. Glumes membranous, hairy, the empty ones 5- or 7-nerved, usually as long as or longer than the flowering ones. Fertile plant: Spikelets very numerous in a large dense globular head, each one solitary at the base of a spine-like rhachis of 4 in. or more, subtended by a much shorter linear-lanceolate bract, the spikelet 6 to 7 lines long, acute or acuminate. Glumes all nearly similar, with 7 or more nerves, the 2 outer ones rather the largest with more nerves than the others. A palea and sometimes 3 stamens in the axil of the 3rd, and an ovary and 3 stamens or staminodes in the terminal one.—Sieb. *Agrostoth.* n. 62; Hook. f. *Fl. Tasm.* ii. 106; F. Muell. *Fragm.* viii. 138; *S. sericeus*, R. Br. *Prod.* 198.

Abundant on the sandy sea shores of **Queensland** from Rockingham Bay southward (Broad Sound, *R. Brown*), **N. S. Wales**, **Victoria**, **Tasmania**, **S. Australia** to the south coast of **W. Australia** (King George's Sound, *R. Brown* and others). Also New Zealand and New Caledonia.

S. alterniflorus, Nees in *Pl. Preiss.* ii. 96, from the character given, would belong to *S. hirsutus*, but the specimens I have seen from Swan River, *Preiss.* n. 1833, belong rather to *S. longifolius*. Both species are in West Australia, but, as far as I have seen, *S. longifolia* from the north down the west coast to Swan River, and *S. hirsutus* only on the south coast.

2. ***S. longifolius***, *R. Br. Prod.* 198.—Closely resembles *C. hirsutus* but quite glabrous except the long cilia of the ligula and sometimes a few on the margins of the leaf-sheaths. Leaves narrow, rigid, often above 1 ft. long but not so pungent as in the Asiatic *S. squarrosus*, of which *S. longifolius* may perhaps be a variety only. Male spikes usually looser than in *S. hirsutus*. Spikelets scarcely 5 lines long, the outer empty glumes shorter than the flowering ones. In the female spikes the outer glumes quite as long as the inner ones, and I found no palea or stamens in the 3rd glume in the spikelets examined.—Nees in *Pl. Preiss.* ii. 95; F. Muell. *Fragm.* viii. 139; *S. fragilis*, R. Br. l.c.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Careening Bay, covering the whole coast, *A. Cunningham*; Quail Island, *Flood*; Nichol Bay, *Walcot*; Port Darwin, *Schultz*, n. 199, 200.

W. Australia. Sharks Bay, *Milne*; Murchison River, *Oldfield*; Swan River, *Drummond*, *Preiss.* n. 1833, *Oldfield*, and possibly King George's Sound.

3. ***S. paradoxus***, *Benth. in Hook. Ic. Pl.* t. 1243, 1244.—Glabrous, divaricately branched, rigid and brittle but not so stout as the preceding species, the branches in clusters of 3 to 6 surrounded by short leaves with loose sheaths, the lower stem-leaves long and narrow; the ligula a dense ring of cilia. Male plant: Spikelets in a dense cluster or head of $\frac{1}{2}$ to $\frac{3}{4}$ in. diameter, 1 to 3 outer bracts lanceolate and about as long as the head, the inner ones much reduced, the spikelets about 3 lines

long, the outer ones nearly sessile, the inner ones pedicellate and sometimes 2 on a pedicel, the pedicel or axis produced into a point shorter than the spikelet. Outer empty glumes 2, several-nerved; flowering glumes 2, nearly equal, longer than the empty ones, each with a palea and 3 stamens. Female plant: Heads the size of the males when in flower, but the bracts larger and broader, and when in fruit the bracts variously enlarged, 1 or 2 often becoming curved, 1 in. long or more, broad with hard centres and scarious margins, sometimes all scarcely changed. Spikelets almost sessile within each bract, the very short pedicel produced into a point much shorter than the spikelet, and sometimes minute or obsolete. Empty glumes prominently 7- or 9-nerved, the 2 outer rather shorter than the 3rd, which is either empty like them or contains a small palea. Fruiting glume shorter, very acute, smooth and shining. Styles distinct.—*Neurachne paradoxa*, R. Br. in App. Sturt Exped. 26; *Panicum pseudoneurachne*, F. Muell. Fragm. viii. 199.

N. S. Wales. Murray and Darling Rivers, *Beckler, Dallachy*.

Central Australia. Between Stokes Range and Cooper's Creek, *Howitt*; near Lake Eyre, *Andrews*; Alice Springs, *Giles*.

The male plant was unknown to R. Brown and unfortunately overlooked by F. Mueller, which accounts for the generic misplacement of the species.

TRIBE II. ANDROPOGONEÆ.—Fertile spikelets with 1 terminal hermaphrodite or female flower, with or without a male one below it, the pedicel usually articulate immediately under the outer glume. Glumes 4 or rarely fewer, the outer one or rarely the 2nd the largest, enclosing the inner ones as well as the flower and fruit, the 3rd glume smaller, usually thin, hyaline and empty, rarely deficient, or rather larger and enclosing a male flower, the upper or flowering glume very thin and hyaline, sometimes entire and awnless, often notched or 2-lobed and bearing a bent awn twisted below the bend, sometimes reduced to a long awn without any basal dilatation. A palea to each flower, often very minute, rarely quite deficient. Stamens 3 or fewer. Lodicules usually small and hyaline or deficient. Styles free or united at the base, with feathery stigmas.

The very thin hyaline and small upper glumes readily distinguish the Andropogoneæ from the Paniceæ, except in the subtribe of Tristegineæ where their texture is firmer, but the bent and twisted awns are those of Andropogoneæ and never occur in Paniceæ.

SUBTRIBE I. ZOYSIÆ.—Spikelets solitary or rarely in clusters of 2 or 3, inserted all round the inarticulate rhachis of a simple spike or raceme. Awns none on the flowering glume, none or straight on the outer ones.

14. ZOYSIA, Willd.

Spikelets 1-flowered, not awned, nearly sessile in a close spike, not distichous, the rhachis continuous. Glumes 2, the outer one broad, complicate, keeled, the inner flowering one much smaller, thin and hyaline. Palea still smaller. Styles distinct. Grain free, enclosed in the somewhat hardened outer glume.

Besides the Australian species, which is common in maritime sands of tropical and eastern Asia and New Zealand, there appear to be one or two natives of Japan or China.

1. *Z. pungens*, Willd.; Kunth, *Enum.* i. 471.—Rhizome creeping in the sands to a great extent, with erect stems rarely above 6 in. high. Leaves flat or convolute, with rigid subulate often pungent points, glabrous except a few cilia at the orifice of the rather loose sheaths. Spike terminal, 1 to $1\frac{1}{2}$ in. long. Spikelets erect, closely appressed in the notches of the rhachis, $1\frac{1}{2}$ to 2 lines long. Outer glume rather acute, broad, smooth and shining, the sides nerveless. Flowering glume completely enclosed, usually much smaller thin and hyaline, but sometimes more than half the outer one and rather more rigid.—R. Br. Prod. 208; F. Muell. *Fragm.* viii. 116; Benth. Fl. Hongk. 418, with the synonyms adduced; Sieb. *Agrostoth.* n. 52.

Queensland. Port Curtis and Moreton Island, *McGillivray*.

N. S. Wales. Port Jackson, *R. Brown*; Saltmarshes near Redbank, *Woolfs*.

Victoria. Sandy coasts of Eastern Gipps' Land, *F. Mueller*.

Tasmania. King's Island, *Neate*.

This is certainly the same as the Hong Kong plant I had referred to *Z. pungens*; the *Z. sinica*, Hance in Seem. *Journ. Bot.* 1869, 168, also from Hong Kong, appears to be a distinct species and should probably include the Japanese *Z. macrostachya*, Franch. and Sabat. *Enum. Pl. Jap.* ii. 187.

15. LAPPAGO, Schreb.

(*Tragus*, Desf.)

Spikelets 1-flowered, not awned, 2 or rarely 3 or 4 together on very short pedicels along the continuous rhachis of a simple spikelike panicle. Glumes usually 3, the outer one, next the rhachis, very minute and sometimes obsolete, the 2nd empty with 5 prominent nerves armed with short rigid hooked bristles, the 3rd or flowering glume and enclosed palea thin and hyaline. Styles distinct, slender. Grain enclosed in the thin palea and glume and rigid outer glume, free from them.

Besides the Australian species which is a common weed in most tropical and temperate regions in the New and the Old World, there are one or two others very closely allied to it. The systematic position of the genus may require further investigation, but its affinities appear to be rather with *Andropogonæ* than with any other tribe.

1. *L. racemosa*, Willd.; Kunth, *Enum.* i. 170, *Revis. Gram. t.*





120.—An annual spreading on the ground or ascending to from 6 in. to 1 ft. in height, usually glabrous, except a few rigid cilia bordering the leaves. Leaves flat, with loose sheaths, the ligula small, split into cilia. Spike-like panicle or raceme 2 to 4 in. long, cylindrical and narrow, the very short peduncles bearing on their end 2 sessile narrow spikelets about 2 lines long, falling off together with the peduncle as little burs, the 2nd glumes with their hooked prickles forming the principal part of the spikelets, the acuminate almost aristate fruiting glumes remaining enclosed within them.—F. Muell. Fragm. viii. 107; Reichb. Ic. Fl. Germ. t. 30; *Tragus racemosus*, Desf.; Döll. in Mart. Fl. Bras. ii. part ii. t. 18.

N. Australia. Sturt's Creek, F. Mueller.

Queensland. Rockhampton and neighbouring districts, Bowman, O'Shanesy and others; Warwick, Beckler; Depot Camp, Mitchell.

N. S. Wales. New England, C. Stuart; Maneroo, Woods; from the Darling to Cooper's Creek, Victorian Expedition and various other collectors.

Victoria. Wimmera, Herb. F. Mueller.

S. Australia. In the interior, Giles, M'Douall Stewart.

In several tropical specimens there is a third or even a fourth spikelet on each peduncle, but I have never seen more than two in the Australian ones.

16. NEURACHNE, R. Br.

Spikelets with 1 terminal hermaphrodite flower, and very rarely a second male one below it, sessile along the continuous rhachis of a simple ovoid or cylindrical spike. Glumes 4, the 2nd the largest, fringed on each side at least in the lower half with long spreading cilia on the intramarginal nerve; 3rd glume smaller and thinner, usually with a small palea in its axil. Fruiting glume smaller thin and often hyaline, the palea also very thin, as long as or longer than the glume. Styles distinct. Grain enclosed in the thin palea and glume, free from them.

The genus is limited to Australia.

Spike ovoid or oblong, $\frac{3}{4}$ to 1 in. long. Outer glume 5- or 7-nerved, with long spreading hairs on the back

1. *N. alopecuroides*.

Spike narrow, 1 to 2 in. long. Outer glume with a transverse callosity on the back bearing long cilia, and below it an ovate very thin space bordered by a thickened margin

2. *N. Mitchelliana*.

Spike narrow, 1 to 2 in. long. Outer glume thin, glabrous or bordered by very few cilia

3. *N. Munroi*.

1. ***N. alopecuroides*, R. Br. Prod. 196.**—Stems erect, 1 to 1½ ft. high, with the nodes usually hairy, otherwise glabrous. Leaves rather short, narrow and rigid, mostly at the base of the stem, glabrous except the dense cilia of the ligula, the upper ones few and small. Spike ovoid or oblong, $\frac{3}{4}$ to 1 in. long. Spikelets numerous, densely crowded all round the rhachis, but spreading and very readily falling away, a few at the base of the spike barren and almost reduced to single ciliate glumes, but more persistent and forming an involucre at the base

of the spike. Each spikelet about 3 lines long, with a tuft of hairs at the base. Outer glume rather shorter, 5- or 7-nerved, tapering to a fine point with a few spreading hairs on the back; 2nd glume many-nerved, tapering to a fine point, densely ciliate with long hairs on each side; 3rd glume rather shorter, with few nerves, sprinkled with a few short hairs. Fruiting glume and palea thin and hyaline.—Nees in Pl. Preiss. ii. 95; F. Muell. *Fragm.* viii. 200; Hook. *Íc. Pl.* t. 1241.

Victoria. Glenelg River, *Robertson*; Grampians, *F. Mueller, Sullivan*; Wimmera, *Dallachy*.

S. Australia. Lofty Range and Bethanie, *F. Mueller*.

W. Australia. King George's Sound and neighbouring districts, *Menzies, R. Brown* and others; Swan River, *Drummond*, 1st coll. *Preiss*, n. 1840; Vasse and Tone Rivers, *Oldfield*.

2. N. Mitchelliana, *Nees in Hook. Lond. Journ.* ii. 410.—Stems from a knotty woolly branching base erect, leafy to the inflorescence or nearly so. Leaves flat, short, spreading, ciliate with a few long hairs or the lower ones woolly-hairy. Spike narrow-cylindrical, 1 to near 2 in. long. Spikelets about 2 lines long, with a tuft of hairs at their base. Outer glume as long as the others, many-nerved, ciliate, marked in the centre on the back with a transverse callosity bearing long rigid horizontally spreading hairs, with a broad cavity underneath it, very thin and almost hyaline, bordered by a prominent nerve on each side; 2nd glume broad to above the middle, pubescent on the back and densely fringed on each side by long spreading hairs, the upper part narrow and glabrous or nearly so; 3rd glume shorter, thin, faintly nerved and not ciliate, either empty or enclosing a small palea. Fruiting glume and palea thin and almost hyaline.—*F. Muell. Fragm.* viii. 200; Hook. *Íc. Pl.* t. 1240.

N. S. Wales. Bogan River, *Mitchell*; Darling Desert, *Victorian Expedition* and others.

3. N. Munroi, *F. Muell. Fragm.* viii. 200.—Habit of *N. Mitchelliana*.—Stems from a more or less woolly knotty base under 1 ft. high. Leaves narrow, convolute or subulate, ciliate at the nodes and ligula, otherwise glabrous. Spike narrow-cylindrical, 1 to near 2 in. long, the rachis pubescent. Spikelets $2\frac{1}{2}$ to 3 lines long, with a tuft of hairs at their base. Outer glume nearly as long as the spikelet, thin, glabrous or with a few marginal cilia; 2nd glume more rigid, acutely acuminate, with about 7 very prominent nerves, the marginal ones fringed in the lower half with long cilia; 3rd glume shorter, much thinner, glabrous, about 5-nerved, with a small palea. Fruiting glume and palea thin and hyaline, the palea larger than the glume.—Hook. *Íc. Pl.* t. 1239; *Panicum Munroi*, *F. Muell. Fragm.* v. 204.

N. S. Wales. Darling Desert, *Beckler*.





17. **PEROTIS**, Ait.

Spikelets 1-flowered, sessile or shortly pedicellate along the continuous rhachis of a loose simple spike or raceme. Glumes 3, 2 outer empty ones linear, rigid, tapering into long terminal straight awns, the lowest the longest. Terminal flowering glume much smaller, thin and hyaline, the palea still smaller. Styles very shortly united at the base, the plumose stigmas short. Grain narrow, free, longer than the terminal glume, enclosed in the 2 rigid outer ones.

The genus extends over tropical and sub-tropical Asia and Africa, the Australian species, closely allied to the common Asiatic and African one, appears to be represented in the Malayan Archipelago.

1. **P. rara**, *R. Br. Prod.* 172.—Stems from a decumbent or branching base, slender, ascending to 1 ft. or rather more. Leaves linear, with subulate points, glabrous except a few marginal cilia especially at the orifice of the sheaths; ligula ciliate. Spike or raceme in some specimens 3 to 4 in., in others at least twice as long. Spikelets always numerous, at first erect at length reflexed, in some specimens almost sessile, in others on pedicels of $\frac{1}{2}$ to above $\frac{1}{2}$ line long, often ciliate with a few hairs; the spikelets very narrow, 2 to 3 lines long without the fine awns which are $\frac{1}{2}$ to 1 in. long. Outer glume with a prominent keel, sometimes glabrous, in a few specimens ciliate with rather long hairs, 2nd glume similar but rather shorter and narrower.—*F. Muell. Fragm.* viii. 115.

N. Australia. Between Norman and Gilbert Rivers, *Gulliver*; in the interior of Arnhem's Land, *M'Dowall Stuart*.

Queensland. Port Curtis and Cape Upstart, *M'Gillivray*; Port Denison, *Fitzalan*; Rockhampton and numerous stations in South Queensland, *Bowman*, *O'Shanesy* and many others; Balonne River, *Mitchell*; towards Cooper's Creek, *Neilson*.

Although generally very different from the common tropical species of *Perotis* (*P. latifolia*, Ait. with broader leaves and much shorter spikelets), there certainly appear to be connecting forms, especially that from the Philippine Islands which Trinius described as *Xystidium maritimum*, and which has been regarded as a slight variety of *P. rara*.

SUBTRIBE II. ROTTBOELLIÆ.—Spikelets awnless, in pairs or rarely solitary, in alternate notches of the articulate rhachis of a simple spike, one sessile fertile and more or less embedded in a cavity of the rhachis, the other pedicellate and barren or rarely fertile.

This subtribe differs from the spicate Euandropogonæ in the total absence of any awn and in the rhachis more deeply excavated for the reception of the sessile spikelet. A few species of *Ischemum* are however intermediate as it were between the two subtribes.

18. **ELIONURUS**, Willd.

Spikelets in pairs, in the alternate notches of the articulate rhachis of a simple spike, 1 sessile with 1 hermaphrodite flower, the other

pedicellate and barren, the spike solitary and densely silky-hairy. Outer glume of the barren spikelet usually spreading. Fertile spikelet appressed. Glumes 4, the outer one the largest erect and 2-lobed, the 2nd shorter, thin but rigid and pointed, 3rd and 4th shorter very thin and hyaline, all without awns. Palea none (or very minute?). Styles distinct. Grain enclosed in the outer glumes, free from them.

The genus is spread over tropical and subtropical America and Africa, extending sparingly into Western Asia. The only Australian species is endemic.

1. **E. citreus**, *Munro*.—Stems slender, $1\frac{1}{2}$ to 2 ft. high. Lower leaves very narrow, almost subulate, with short broad sheaths; upper ones with long loose sheaths passing into the sheathing bracts, the upper one on the peduncle below the spike. Spike 3 in. long, densely silky with the spreading hairs of the rhachis and pedicels. Barren spikelets on a short broad pedicel, the outer glume narrow, very acute, spreading, fringed with long cilia, the 2nd erect rather shorter, the prominent keel produced into a fine point, the 3rd small and hyaline; no flower. Sessile spikelet erect and appressed, much flattened, 5 to 6 lines long. Outer glume lanceolate, 7-nerved, the 2 lateral nerves thickened ciliate and produced into long erect ciliate lobes or thick points, 2nd glume $\frac{1}{2}$ as long, finely pointed.—*Andropogon citreus*, R. Br. Prod. 203.

Queensland. Northumberland Islands, R. Brown; "Native Wells," Armit.

19. HEMARTHRIA, R. Br.

Spikelets in pairs, in the alternate notches of a simple spike, 1 sessile and half embedded in a cavity of the scarcely articulate rhachis with 1 hermaphrodite flower, the other on a closely appressed and often adnate pedicel reduced to 2 or 3 empty glumes, the spikes single on each peduncle above a sheathing bract and often flattened. Glumes in the sessile spikelet 4, the outer one appressed and covering the cavity of the rhachis, the 2nd thinner and concave or keeled, the 3rd and 4th and the palea in the 4th thin and hyaline. Styles distinct. Grain enclosed in the glumes but free from them.

A small genus of closely allied species, widely spread over the warmer regions of the globe especially on the sea-coasts of the Old World, the Australian species very closely allied to, if not identical with, a common Asiatic and Mediterranean one.

1. **H. compressa**, R. Br. Prod. 207.—Stems decumbent or creeping at the base, rather rigid, ascending to 1 ft. or rather more, slightly branched. Leaves narrow, glabrous or the lower ones sprinkled with a few long hairs. Spikes solitary on the branches or nearly so, more or less compressed, rigid, 3 to 5 in. long, often $1\frac{1}{2}$ lines broad. Spikelets all closely appressed, 3 to $3\frac{1}{2}$ lines long. Outer glume many-nerved, tapering into a very variable point, sometimes very short and straight especially in the sessile spikelet, sometimes elongated and fine or

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minutely hooked at the extremity, or in southern specimens, especially towards the end of the spike, terminating in a rather long inflexed rigid hook. In the pedicellate spikelet the point of the outer glume is often longer finer and straight, but occasionally that also is hooked and more rarely the 2nd glume ends in a small hook.—*H. uncinata*, R. Br. l. c., Hook. f. Fl. Tasm. ii. 107; Brongn. in Duperr. Voy. Bot. t. 15.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *Bailey*; Rockhampton, *O'Shanesy*; Dawson River, *F. Mueller*; also in *Leichhardt's* collection.

N. S. Wales. Port Jackson, *R. Brown*, *Woolfs* and others, *Sieber*, n. 88; Hastings and Clarence Rivers, *Beckler*, *Wilcox*.

Victoria. Yarra, Ovens and Upper Hume Rivers, Dandenong Ranges and several other localities, *F. Mueller* and others.

Tasmania. Derwent River, *R. Brown*; Northern Coasts of the Island, *Gunn*; South Port, *C. Stuart*.

S. Australia. Lobethal and near Adelaide, *F. Mueller*.

W. Australia. Common about Swan River and King George's Sound, *Fraser*, *A. Cunningham*, *Drummond*, n. 152, 385, and others.

The hook at the end of the glumes, upon which *Brown* separated his *H. uncinata* from the *H. compressa*, is exceedingly variable. In the southern specimens generally it is long and very rigid on some of the glumes at least towards the upper end of the spike; in the common form figured by *Brongniart* it is small and only observable on a few glumes; most of the northern specimens have all the outer glumes fine-pointed without hooks. The latter form is also in East India and comes very near to, if it be not identical with, the south Mediterranean *H. fasciculata*, *Kunth*.

20. MANISURIS, Swartz.

Spikelets in pairs in the 1-sided notches of the articulate rhachis of a simple spike, 1 sessile and half embedded in a cavity on the rhachis with 1 hermaphrodite flower, the other on an appressed pedicel reduced to 2 empty glumes, the spike single on the peduncle above a sheathing bract. Glumes of the sessile spikelet 4, the outer one the largest, globular and hard, covering the cavity of the rhachis, the 2nd smaller, concave, thin but rigid, 3rd and 4th small thin and hyaline. Palea none (or very minute?). Styles distinct. Grain enclosed in the hard outer glumes, free from them.

The genus is now generally reduced to the single species, widely spread over the warmer regions of the New and the Old World.

1. *M. granularis*, Sw.; *Kunth*, *Enum.* i. 469.—A branching leafy annual of 1 ft. or more, sprinkled or villous with spreading hairs, the leaf-sheaths usually hispid, the floral leaves generally exceeding the enclosed sheathing bracts and spikes, and the narrow sheathing bracts on the separate peduncles as long as or longer than the spikes, the whole inflorescence forming an irregular leafy panicle. Spikes mostly about $\frac{1}{2}$ in. long. Spikelets scarcely more than $\frac{1}{2}$ line diameter, the prominent grain-like hard and pitted outer glumes alone conspicuous,

and appearing in a single row on one side of the rhachis.—Beauv. *Agrost.* t. 21, f. 10.

N. Australia. Depot and Sturt's Creek, *F. Mueller*.

21. OPHIURUS, Br.

Spikelets singly sessile and embedded in the alternate cavities of the articulate rhachis of a simple spike, with 1 hermaphrodite or female flower and often a male one below it, the spike single on each peduncle above a sheathing bract, and cylindrical or nearly so. Glumes 4, the outer one hard, closely covering the cavity of the rhachis, the 2nd thin but rather rigid, concave or keeled, the 3rd and 4th as well as the paleæ thin and hyaline, all awnless. Styles distinct. Grain enclosed in the glumes but free from them.

A small tropical Asiatic and African genus, the only Australian species extending also into East India. The genus only differs from *Rottboellia* in the want of the pedicellate barren spikelets.

1. *O. corymbosus*, *Gærtn.*; *Kunth, Enum.* i. 464.—Stems erect, branching, said to attain 5 or 6 ft. in height. Upper leaves few with long sheaths, quite glabrous in the typical form. Spikes rigid, 2 to 5 in. long and scarcely above 1 line diameter, pedunculate and clustered in the upper leaf-sheaths, but each peduncle with a long narrow sheathing bract below the spike. Outer glume lanceolate, 2 lines long, very hard, 5-nerved and pitted or tuberculate between the nerves, 2nd glume in the deep cavity very concave and keeled, 3rd enclosing a palea and male flower, 4th or terminal one with a hermaphrodite (or female?) flower.—*Rottboellia corymbosa*, *Linn.*; *Roxb. Corom. Pl.* t. 181.

N. Australia. Upper Victoria and Albert Rivers, *F. Mueller*.

Queensland. Endeavour River, *Banks and Solander*; Kennedy District, *Daintree*; Rockhampton, *O'Shanesy, Thozet*; Herbert's Creek, *Bowman*.

Widely spread over East India, also in tropical Africa.

Var? *pubescens*. A single small specimen, with an apparently annual root, from Hooker's Creek, *F. Mueller*. Leaves very pubescent. Spikes like the typical ones, but with the outer glume still more pitted and tuberculate. Perhaps a distinct species.

22. ROTTBOELLIA, Linn. f. partly.

Spikelets in pairs in the alternate notches of the articulate rhachis of a simple spike, 1 sessile and embedded in a cavity of the rhachis, with 1 hermaphrodite flower and sometimes a male one below it, the other on a closely appressed pedicel but often spreading, with a male or rarely hermaphrodite flower, or reduced to 1 or 2 empty glumes, the spike single on each peduncle above a sheathing bract and cylindrical or nearly so. Glumes in the sessile spikelet 4, the outer one coriaceous, closely covering the cavity of the rhachis, the 2nd thinner but often rigid, concave or keeled, the 3rd and 4th and the paleæ very thin and



hyaline, all awnless. Styles distinct. Grain enclosed in the glumes but free from them.

The genus extends over tropical Asia and Africa with at least one American species. Of the four Australian ones, two have a wide range in tropical Asia, the other two are endemic.

Rottboellia was originally founded by the younger Linnaeus on five species which are now separated into as many genera. Brown's proposal to restrict the name to the *R. exaltata* and allied species since added has now been generally adopted.

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|---|----------------------------|
| Stems scarcely branched, with single spikes of 2 to 3 in. the articles of the spike densely ciliate at the top. | |
| Sessile spikelet 1-flowered, the outer glume silky villous | 1. <i>R. formosa</i> . |
| Stems usually branched. Peduncles solitary in the upper sheaths, with a spike of 3 to 6 in., quite glabrous. | |
| Sessile spikelet above 2 lines long, 2-flowered | 2. <i>R. exaltata</i> . |
| Stems branched. Peduncles clustered in the upper sheaths, the spikes slender, under 3 in., glabrous. Sessile spikelet under 2 lines long, 1-flowered. | |
| Outer glume of the sessile spikelet tuberculate at the base, the nerves scarcely winged at the top. Pedicellate spikelet barren | 3. <i>R. muricata</i> . |
| Outer glume of the sessile spikelet smooth, the 2 nerves distinctly winged at the top. Pedicellate spikelet often fertile | 4. <i>R. ophiuroides</i> . |

1. ***R. formosa***, *R. Br. Prod.* 206.—Apparently annual. Stems scarcely branched, above 1 ft. long. Leaves narrow, more or less hirsute with spreading hairs. Peduncles solitary in the upper axils, bearing each a sheathing bract and a single cylindrical spike of 2 to 3 in., not $1\frac{1}{2}$ lines diameter, the rhachis exceedingly fragile and each article crowned by a ring of dense, often purplish hairs. Outer glume of the fertile spikelet broad hard and obtuse, but densely covered with appressed hairs of which the upper ones are longer giving it an acute appearance; 2nd glume broad concave and thin, 3rd and 4th smaller, very thin and hyaline, no male flower in the 3rd, the 4th alone flowering, the palea minute or deficient. Barren spikelets sessile, of a single ovate or lanceolate 3- or 5-nerved glabrous glume, with sometimes a second smaller one in its axil.—Kunth, *Revis. Gram.* i. t. 91.

N. Australia. Islands of the North Coast, *R. Brown*; Depot Creek, Upper Victoria River, *F. Mueller*; North Coast of Arnhem's Land, *M^cKintay*.

2. ***R. exaltata***, *Linn. f. Suppl.* 114.—Stems stout, erect, attaining 6 to 10 ft. Leaves long and rather broad, scabrous, the sheaths more or less hispid. Peduncles solitary in the upper sheaths. Spikes often above 6 in. long, cylindrical, 2 lines diameter when old, the upper part often slender with abortive spikelets, the rhachis and spikelets perfectly glabrous. Outer glume of the fertile spikelets ovate, rather obtuse, slightly convex, about 2 lines long, coriaceous and smooth but with many nerves more visible inside than out; 2nd glume acute, deeply

immersed, 3rd and 4th thin and almost hyaline, both with perfect paleas, the 3rd with a male the 4th with a hermaphrodite flower. Pedicellate spikelets much flatter, rather smaller, with 2 male flowers or only a palea in the 3rd glume.—Kunth, Enum. i. 466, R. Br. Prod. 206; Roxb. Corom. Pl. t. 157.

N. Australia. Islands of the North Coast, *R. Brown*.

Very common in tropical Asia.

3. *R. muricata*, Retz; Kunth, Enum. i. 467.—Stems branching, 4 to 6 ft. high. Leaves rather broad, glabrous except a few cilia at the orifice of the sheaths, the margins scabrous. Spikes 1 to 2 in. long, very brittle, clustered in the upper axils on very unequal slender peduncles, with a close sheathing bract at the base of each. Spikelets about 2 lines long; outer glume of the sessile spikelet closely appressed, obtuse, slightly 2-winged at the end, coriaceous, bearing at the base a few tubercles either on each side or sometimes on the back, the spikelet containing only a single hermaphrodite flower. Pedicellate spikelet either including a male flower or reduced to empty glumes.—*R. glandulosa*, Trin. in Mem. Acad. Petersb. ser. 6, ii. 250; *Cælorhachis muricata*, Brongn. in Duperr. Voy. Bot. 65, t. 14.

Queensland. Etheridge River, *Herb. F. Mueller*.

Also in the Malayan Peninsula and Archipelago.

4. *R. ophiuroides*, Benth.—A tall erect glabrous grass. Leaves long, often $\frac{1}{2}$ in. broad, the upper ones with long sheaths passing into sheathing bracts. Peduncles crowded on the short erect branches of a large terminal leafy panicle, each branch within a sheathing bract, and a narrow sheathing bract on each peduncle. Spikes slender, simple, 2 to 3 in. long, quite glabrous and very brittle. Spikelets $1\frac{1}{4}$ to 2 lines long, both the sessile and the pedicellate ones with a hermaphrodite flower, or the pedicellate with a male flower or reduced to empty glumes. Glumes all obtuse, awnless and smooth, the outer one with the marginal nerves, and the 2nd with the keel winged at the top as in *Ischæmum*.—*Ischæmum rottboellioides*, R. Br. Prod. 205; *Andropogon rottboellioides*, Steud. Syn. Glum. i. 382; F. Muell. Fragm. viii. 128 (excl. syn. Retz and Brongn.).

N. Australia. Gulf of Carpentaria, *R. Brown*; Victoria and Fitzmaurice Rivers, *F. Mueller*; Port Darwin, *Schultz*, n. 798.

Queensland. Rockingham Bay, *Dallachy*; Broad Sound, *Bowman*.

SUBTRIBE III. MAYADÆÆ.—Spikelets unisexual, the males usually paniculate, the females spicate at the base of the males or in a separate inflorescence. Grain enclosed in a hard smooth case, which is either the pericarp or an outer glume or a subtending bract according to the genus.

This subtribe is to the Andropogonæ what *Spinifex* and *Thuarea* are to the Paniceæ and includes amongst other non-Australian genera the well-known *Coix* and *Zea*.

23. CHIONACHNE, R. Br.

Spikelets monœcious, in simple spikes, the upper ones male and 2-flowered, the lower female and 1-flowered, the spikes solitary on peduncles bearing a sheathing bract under the spike. Male spikelets in pairs. Outer glume the largest, membranous and many-nerved, 2nd thinner with fewer nerves, 3rd and 4th thinner and hyaline, each enclosing a hyaline palea and 3 stamens. Female spikelets singly sessile in the notches of the rhachis, closely appressed and superposed in a single row or solitary. Outer glume very thick hard and smooth, completely enclosing the rest of the spikelet, and the thick margins embracing the rhachis, 2nd and 3rd glumes both empty, and 4th glume enclosing the ovary gradually narrower and thinner. Palea narrow, hyaline. No lodicules. Style single within the glume, divided beyond it into 2 long shortly feathery stigmas. Grain enclosed in the hard smooth outer glume but free from it, the rhachis of the spike at length articulate between each female spikelet.

A small genus, extending over tropical Asia. Of the two Australian species one is a common Indian one, the other apparently endemic though closely allied to one from the Indian Peninsula.

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| Peduncles several in the upper leaf-sheaths. Bracts spreading under the spike. Spike 1 in. or rather longer, with only 1 female spikelet | 1. <i>C. barbata</i> . |
| Peduncles solitary in the leaf-sheaths, the bract closely embracing the base of the spike. Spike 3 to 4 in. long, with 3 to 6 female spikelets | 2. <i>C. cyathopoda</i> . |

1. *C. barbata*, R. Br. in Benn. Pl. Jav. Rar. 18. — An erect stout branching grass, attaining several feet, but said to be annual. Leaves flat, broad or narrow, very scabrous, the sheaths usually sprinkled with rigid spreading hairs. Nodes glabrous or bearded. Peduncles slender but rigid, usually several in the upper axils, very unequal in length but the longest shorter than the leaf, each bearing a broadly lanceolate acuminate bract at the base of the spike, usually about 1 in. long, at first close and sheathing but at length opening out. Spike scarcely exceeding the bract. Female spikelet solitary at the base, ovoid-oblong, nearly 4 lines long; males 6 to 10 in pairs, 4 to 5 lines long, narrow, rather acute. Rhachis of the spike articulate above and below the female spikelets, the peduncle dilated and cup-shaped under it.—*Coix barbata*, Roxb. Hort. Beng. 66 and Fl. Ind. iii. 569.

Queensland. Burdekin River, Bowman; Cardwell District, Bailey (Herb. F. Mueller).

Widely spread over East India and originally described as *Coix arundinacea*, Willd. Spec. Pl. iv. 203, but that specific name having been preoccupied by Lamarek, Brown and Bennett in transferring it to *Chionachne* took up Roxburgh's name of *barbata* entered into the Hortus Bengalensis (1814) as well as in several herbaria, though described only in the Flora Indica. Thwaites had since, Enum.

Ceyl. Pl. 357, substituted for it Sprengel's specific name *Königii*, published as *Coix Königii*, Spreng. Syst. i. 239, which addition however to the synonymy seems scarcely to be justified by the above data.

The Australian specimens are imperfect but quite sufficient to establish the identity with the Indian ones, which have helped to make out the above character. They were included by F. Mueller in his *Sclerachne cyathopoda*.

2. *C. cyathopoda*, F. Muell.—An erect grass of several feet, less branched than *C. barbata*. Leaves long and flat, scabrous on the upper surface, the sheaths either quite glabrous or sprinkled with rigid hairs arising from tubercles. Peduncles usually solitary within the leaf-sheaths, with a narrow sheathing bract shorter than the spike and remaining closed over its base. Spikes 3 to 4 in. long with 3 to 6 female spikelets at the base, exactly superposed in a single row and closely appressed, the hard shining outer glume 4 to 5 lines long and embracing the rachis as in *C. barbata*, the female part of the spike usually included in the leaf-sheath even when ripe. Male spikelets numerous in the upper part of the spike, usually turned in pairs to one side, 4 to 6 lines long, the glumes varying from obtuse to acutely acuminate.—*Sclerachne cyathopoda*, F. Muell. Fragm. viii. 116.

N. Australia. Upper Victoria River, Hooker and Sturt's Creeks, F. Mueller; Gulf of Carpentaria, Landsborough.

Queensland. Brisbane River, Bailey; Dawson and Comet Rivers, Leichhardt; Rockhampton and neighbourhood, Bowman, Thozet, O'Shanesy.

In inflorescence this species comes near to an unpublished East Indian one named by Munro in several herbaria, *C. Wightii*, but appears to be sufficiently distinct. It varies considerably in the length and acuteness of the male spikes, in the hairy or glabrous leaf-sheaths, etc., but the specimens are insufficient to establish any material distinctions. F. Mueller included among them those of the true *C. barbata*. The genus *Sclerachne* to which he refers both species was established on a scarce Japanese plant, only known from Horsfield's specimens, and differing in the form assumed by the fruiting glume, as well as in the relative numbers and position of the male and female spikelets.

SUBTRIBE IV. EUANDROPOGONEÆ.—Spikelets in pairs or in threes rarely solitary, in the notches or at the end of simple spikes or of the branches of a panicle, the rachis usually but not always articulate at each notch, and not so deeply excavated as in *Rottboellia*, one spikelet sessile and fertile (hermaphrodite or female), the other one or two when present male or neuter, but sometimes rudimentary or wholly deficient. Flowering glume of the fertile spikelet usually bearing the awn characteristic of the tribe or reduced to that awn, which is deficient only in a very few species or varieties.

24. **HETEROPOGON**, Pers.

Spikelets 1-flowered, monœcious, in pairs in the notches of the articulate rachis of a simple 1-sided spike, the females sessile, cylindrical, turned to one side of the spike, the males lanceolate, awnless, shortly pedicellate, imbricate on the other side of the spike. Glumes in the female spikelet 4, the outer one hard convolute, the 2nd

keeled, the 3rd very thin and hyaline, 4th or terminal glume a hard twisted and bent awn, attenuate and flexuose or narrow and hyaline at the base as in *Andropogon*. Paleas very small and thin or none. Styles distinct. Grain enclosed in the hardened glumes but free from them.

A genus of several species, chiefly tropical, in the New as well as the Old World. Both the Australian species extend into tropical Asia, and one over the general area of the genus.

Spikes about 2 in. long; male spikelets 3 to 4 lines . . . 1. *H. contortus*.
Spikes 3 to 6 in. long; male spikelets $\frac{1}{2}$ in. . . . 2. *H. insignis*.

1. **H. contortus**, *Roem. et Schult. Syst. ii.* 386.—Stems ascending or erect, 1 to 2 ft. high. Leaves narrow, ciliate with a few long hairs, the sheaths flattened. Spikes pedunculate, 1 to 2 in. long without the awns. Male or barren spikelets 3 to 4 lines long, green, ciliate, closely imbricate in 2 rows along one side of the spike almost concealing the females. Female spikelets narrow, the outer glume hard, obtuse, convolute, the 2nd narrow with a hard centre, the hairs surrounding the spikelet brown and silky. Awn protruding often to 2 in. and very much twisted.—*Andropogon contortus*, Linn.; Kunth, *Enum. i.* 486; R. Br. *Prod.* 201; F. Muell. *Fragm. viii.* 120; *Heteropogon hirtus*, Pers. *Syn. ii.* 533; *Andropogon striatus*, R. Br. *Prod.* 201.

N. Australia. Islands of the North Coast, *R. Brown*; Victoria River, *Elsey*; Strangways River, *M'Douall Stuart*; Port Darwin, *Schultz. n.* 10, 146, 151; Sweers Island, *Henne*,

Queensland. Keppel Bay, *R. Brown*; Endeavour River, *Banks and Solander*; North-east Coast, *A. Cunningham*; Rockingham Bay, *Dallachy*; Moreton Bay, *F. Mueller, Bailey, Leichhardt*; Rockhampton, *O'Shanesy*; Springsure, *Wuth.*

N. S. Wales. Hastings and Clarence Rivers, *Bailey*.

Extends over tropical and sub-tropical Asia, Africa and America.

Andropogon tenuis, R. Br. *Prod.* 201, from Keppel Bay, appears to be only a smaller slender more glabrous variety or state of *H. contortus*.

2. **H. insignis**, *Thw. Enum. Ceyl. Pl.* 437.—A much more robust plant than *H. contortus*, said to attain from 8 to 10 ft. Leaves narrow, with flattened sheaths, glabrous or rarely sprinkled with long loose hairs. Spikes 3 to 6 in. long without the awns. Lower male or barren spikelets lanceolate, acute, about $\frac{1}{2}$ in. long, the upper ones more acuminate and contracted at the base, often $\frac{3}{4}$ in. long. Outer glume glabrous, the 2nd with inflexed hyaline ciliate margins. Female spikelets 3 to 4 lines long, brown and pubescent on a short villous brown pedicel. Outer glume obtuse, the midrib thick and prominent, with a furrow on each side. Awn 3, 4 or even 5 in. long.—*Andropogon triticeus*, R. Br. *Prod.* 201; F. Muell. *Fragm. viii.* 120.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Arnhem's Land, *M'Kinlay*; Port Darwin, *Schultz, n.* 30; Port Essington, *Armstrong*; Bountiful Island, *Henne*.

Queensland. East coast, *R. Brown*; Lord Howick's group, *F. Mueller*; Rockingham Bay, *Dallachy*; Rockhampton, *Bowman, Thozet, O'Shanesy*.

Also in Timor and Ceylon.

25. ISCHÆMUM, Linn.

(Spodiopogon, Trin. Meoschium, Beauv. Hologamium, Nees.)

Spikelets in pairs in the alternate notches of the articulate flexuose rhachis of simple spikes, 1 sessile with 1 hermaphrodite terminal flower and a male one below it, the other pedicellate and either similar or with only one hermaphrodite or one or two male flowers or reduced to empty glumes, the spikes either solitary or 2 or more, sessile or nearly so at the end of the common peduncle. Glumes in the sessile spikelet 4, the outer one the largest, awnless, truncate or 2-toothed at the top; 2nd glume keeled and sometimes produced into a short straight awn, 3rd glume rather smaller, thin, enclosing a palea and 3 stamens; terminal glume a twisted and bent awn, attenuate or hyaline and bifid at the base as in *Andropogon*. Palea small and thin or none. Styles distinct. Grain enclosed in the glumes but free from them.

The genus is chiefly Asiatic with a few tropical African and American species. F. Mueller follows Steudel in uniting it with *Andropogon*, whilst others divide it into almost as many genera as there are species.

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| Sessile spikelet 2-flowered, awnless. Pedicellate spikelet 1-flowered, awned. Outer glume membranous. Spikes 3 to 5 | 1. <i>I. truncatiglumis</i> . |
| Spikelets both 2-flowered and awned. Outer glume rigid. Spikes 2 or 3, rarely 4, erect, often appressed so as to appear like 1 cylindrical spike. | |
| Nodes glabrous. Stem tall erect | 2. <i>I. arundinaceum</i> . |
| Nodes bearded. Stems 2 to 3 ft. high. Awn exserted. Spikes 3 to 4 in., spikelets 4 to 5 lines long . . . | 3. <i>I. triticeum</i> . |
| Spikes 1½ to 3 in., spikelets about 3 lines long . . . | 4. <i>I. australe</i> . |
| Nodes bearded. Stems creeping or diffuse, shortly ascending. | |
| Glabrous. Rhachis of the spike not ciliate. Outer glume winged at the top. Awn concealed in the spikelet | 5. <i>I. muticum</i> . |
| Leaves hairy. Rhachis of the spike ciliate. Outer glume wrinkled on the base. Awn shortly exserted | 6. <i>I. ciliare</i> . |
| Sessile spikelet 2-flowered, awned. Pedicellate spikelet unawned, with a male or without any flower. | |
| Spikes 2. Habit of <i>I. ciliare</i> | 7. <i>I. decumbens</i> . |
| Spike solitary. Pedicellate spikelet without flowers. Spike slender. Sessile spikelets flat, closely appressed, pectinate-ciliate on each side. No awn | 8. <i>I. pectinatum</i> . |
| Spike rigid. Articles of the rhachis and pedicels ovate, convex, smooth and shining resembling sessile spikelets | 9. <i>I. fragile</i> . |
| Spike solitary. Pedicellate spikelets lanceolate, flattened, with 2 male flowers | 10. <i>I. laxum</i> . |

1. *I. truncatiglumis*, F. Muell. Herb.—A glabrous erect grass of about 2 ft. or rather more, the nodes not bearded. Spikes 3 to 5, sessile and clustered at the end of a long peduncle, 1½ to 2½ in. long,

the rachis glabrous, the pedicels ciliate with a few long hairs. Spikelets scarcely 2 lines long, the sessile one 2-flowered; outer glume rather broad and often shorter than the others, membranous, 5-nerved, truncate and toothed at the end, ciliate on each side with long hairs; 2nd glume thin, acute, slightly keeled, 3rd rather smaller but nearly similar, enclosing a palea and male flower, 4th glume under the hermaphrodite flower narrow, very thin and hyaline but scarcely smaller, entire and unawned. Pedicellate spikelet much narrower; outer glume 3-nerved, acute, with a few dorsal hairs, 2nd glume thin and very narrow, 3rd very thin and hyaline, empty, 4th under an apparently female flower reduced to the twisted awn of the genus, slightly dilated and ciliate at the base.

N. Australia. Arnhem's Land, *F. Mueller*. The aspect of the species is nearly that of the Asiatic genus *Apocypis*, but the characters rather those of *Ischæmum*.

2. *I. arundinaceum*, *F. Muell. Herb.*—Stems very erect, several feet high, quite glabrous, the nodes not bearded. Leaves long, mostly erect, glabrous except a few cilia at the orifice of the sheaths, the ligula short. Spikes 2 to 4 in. long, 2 together as in *I. australe* and the structure the same, but the spikelets narrower, mostly about 3 lines long.

N. Australia. Roper River, *F. Mueller*; Port Darwin, *Schultz*, n. 30, 182, 815.

This and the three following species, united into one by *F. Muell. Fragm.* viii. 121, are very nearly allied to each other, but, as far as our specimens go, appear to be constantly distinct.

3. *I. triticeum*, *R. Br. Prod.* 205.—Very near *I. muticum*, but a coarse plant, ascending to 2 or 3 ft. Leaves mostly long and broad, contracted at the base or scarcely cordate, glabrous or the lower sheaths hairy. Spikes 2 together, 3 to 4 in. long. Spikelets 4 to 5 lines long, more acuminate than in *I. muticum*. Outer glume smooth and shining at the base, several-nerved and often ciliate with a few hairs at the end, the wings of the lateral nerves often unequal; inner glumes rather rigid, the 3rd with a rigid palea and male flower, the 4th under the terminal flower more hyaline, shortly 2-fid, the awn usually exerted and sometimes $\frac{1}{2}$ in. long. Pedicellate spikelet nearly similar, but as in *I. muticum* rather narrower, the wings and nerves irregular, and the awn often shorter. — *Andropogon triticeiformis*, *Steud. Syn. Glum.* i. 376.

Queensland. Keppel and Shoalwater Bays and Broad Sound, *R. Brown*; Endeavour River, *A. Cunningham*; Cape York and Port Curtis, *M'Gillivray*; Moreton Bay, *F. Mueller*.

N. S. Wales. Clarence River, *Wilcox*.

4. *I. australe*, *R. Br. Prod.* 205.—Stems from a shortly decumbent base or creeping rhizome erect, 2 to 3 ft. high, but not stout. Leaves rather narrow, glabrous or slightly hairy in the typical form, the nodes always bearded, the upper sheaths very long. Spikes 2 together on a

long peduncle, sessile and erect, $1\frac{1}{2}$ to 3 in. long, the rhachis and pedicels slightly ciliate. Spikelets 3 lines long or scarcely more; otherwise the same as in *I. triticeum*. Awn of the sessile spikelet $\frac{1}{2}$ to $\frac{1}{3}$ in. long, of the pedicellate spikelet shorter or reduced to a short point.—*Andropogon cryptatherus*, Steud. Syn. Glum. i. 376.

N. Australia. Near Sea Range, *F. Mueller*.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *C. Stuart*; also in *Bidwill's* collection.

N. S. Wales. Port Jackson, *R. Brown*; Macleay River, *Beckler*.

Var. *villosum*. Leaves more hairy and very scabrous. Rhachis and pedicels of the spikes densely ciliate with long hairs and the spikes often above 3 in. long. *I. villosum*, *R. Br.* Prod. 205; *Andropogon villiferus*, Steud. Syn. Glum. i. 376.—North Coast, *R. Brown*; Goold Island, *M. Gillivray*; Mount Wheeler, *Thozet*.

5. *I. muticum*, Linn.; Kunth, Enum. i. 512.—Stems diffuse or creeping at the base, ascending to from 6 in. to above 1 ft., rather stout and leafy to the inflorescence. Leaves lanceolate, rather short, often cordate at the base, quite glabrous, the upper one reduced to a sheathing bract very near or close to the spikes. Spikes 2 together but sessile erect and closely appressed so as to appear like one thick cylindrical spike of 1 to 2 in., the rhachis and thick pedicels quite glabrous. Spikelets about 3 lines long. Outer glume of the sessile one paleaceous, broad, obtuse acute or mucronate, several-nerved, the 2 lateral nerves winged towards the top, 2nd glume narrower thinner, acute, the keel winged towards the end, 3rd thin but rigid and acute, with a male flower, the 4th under the hermaphrodite flower thin and hyaline, entire and awnless or slightly notched with a minute awn. Pedicellate spikelet narrower but containing a hermaphrodite flower in the specimens examined.—*Andropogon muticus*, Steud. Syn. Glum. i. 374; *F. Muell.* Fragm. viii. 120 partly.

Queensland. Rockingham Bay, *Dallachy*.

Widely spread on the sea-coasts of tropical Asia and the South Pacific Islands.

6. *I. ciliare*, Retz, Obs. vi. 36 (not of Kunth) var. ? podostachyum.—Stem in the specimen seen slender, under 1 ft. high, erect from a shortly decumbent or creeping base. Leaves short, glabrous, the ligula prominent. Nodes bearded. Spikes scarcely 1 in. long, 2 at the end of the peduncle, but one of them shorter and attached lower down, giving the other a pedunculate appearance. Pedicels ciliate. Sessile spikelet 3 lines long, the outer glume lanceolate, acutely acuminate, the nerves more conspicuous and not so smooth as in the typical *I. ciliare* and in *I. decumbens*; 2nd glume as long but thinner narrow and keeled, 3rd nearly as long, very acute, with a male flower, 4th or terminal glume hyaline, deeply 2-lobed with a slender awn not twice as long, enclosing the hermaphrodite flower. Pedicellate spikelet nearly similar, but containing only a male flower and no awn.

N. S. Wales. Hunter's River, *United States Exploring Expedition*.

This is most probably a distinct species, but having seen only a single specimen, I

doubt whether the peculiar inflorescence may not be accidentally abnormal. The typical *I. ciliare*, Retz, (*Spodiopogon obliquivalvis*, Nees in Pl. Meyen. 185; *Andropogon malacophyllus*, Steud. Syn. Glum. i. 372,) is common in East India; besides the 2 spikes being sessile from the same point, it has the outer glume shorter, broader and more coriaceous than in our plant, and the pedicellate spikelet is awned and 2-flowered like the sessile one. By an unfortunate oversight, Kunth mis-took the *Anthraxon ciliare*, Beauv., for Retz's *Ischæmum ciliare*, although Beauvois had expressly pointed out the generic difference of the two plants.

7. *I. decumbens*, Benth.—A weak decumbent plant with the habit of *I. ciliare*, the stems ascending to about 1 ft. in the specimens seen, the nodes bearded. Leaves rather short, chiefly at the base of the stem, more or less hairy, the upper ones few and short with long sheaths. Spikes 2 together, both sessile and erect, 1 to 1½ in. long, the rhachis and pedicels shortly ciliate. Sessile spikelet 2½ to 3 lines long, the outer glume ovate-lanceolate, rigid, smooth and shining, the nerves visible only towards the end, the 2 lateral ones produced into short points but not winged, 2nd glume keeled and pointed but not winged, 3rd acute, with a male flower, 4th under the hermaphrodite flower hyaline but not so thin as in some species, bifid, with a fine awn often ½ in. long. Pedicellate spikelet reduced to a single narrow empty glume.

N. Australia. Port Darwin, *Schultz, n.* 126. F. Mueller, *Fragm.* viii. 119, refers this to the Indian *I. ciliare*, Retz, (*Andropogon malacophyllus*, Steud.), which it resembles at first sight, but from which it is distinctly separated, if the reduction of the pedicellate spikelet, the shape of the glumes, etc., prove as constant as they appear to be in our specimens.

8. *I. pectinatum*, Trin. in Mem. Acad. Petersb. ser. 6. ii. 296.—Stems tufted and leafy at the base, about 1 ft. high or rather more. Lower leaves narrow, flat, under 6 in. long, those on the stem few, reduced to long close sheaths with very short erect laminae. Spike single, pedunculate above the last sheath, rather slender, straight or slightly curved, usually about 2 in. but sometimes twice that length. Sessile spikelets closely appressed and imbricate on one side of the rhachis, much flattened, 2 lines long or rather more. Outer glume broad, truncate or retuse, thin but rigid, 7-nerved, the outer nerves close to the margin elegantly pectinate-muricate in the lower part, and produced upwards into short wings; 2nd glume narrower, acute, keeled, 3rd glume thin and hyaline with a palea and male flower, terminal glume with a hermaphrodite flower shorter, rather broad, obtuse, very thin and hyaline, with a faint central nerve but no awn, the palea similar but without the central nerve. Pedicellate spikelet reduced to a single few-nerved acuminate glume, slightly spreading.—*Andropogon falcatus*, Steud. Syn. Glum. i. 369; F. Muell. *Fragm.* viii. 118.

Queensland. Brisbane River, Moreton Bay, *C. Stuart, Bailey*; Rockhampton and neighbourhood, *Lawman* and others; Darling Downs, *Law*; Mackenzie River and other stations, *Leichhardt*.

Also in Ceylon and the Indian Peninsula.

9. **I. fragile**, *R. Br. Prod.* 205.—Stems slender, ascending or erect, $1\frac{1}{2}$ to 2 ft. high. Leaves narrow, those on the stem with long and loose sheaths, the uppermost sheath close and slender. Spike single, about $1\frac{1}{2}$ in. long, rigid, on a long peduncle. Articles of the rhachis and pedicels of the barren spikelets similar to each other, about as long as the fertile sessile spikelet, ovate-turgid almost hemispherical, hard and shining outside, the inner cavity closed by a thin membrane, the two assuming the appearance of two collateral spikelets, the fertile spikelet sessile between them on the other side of the rhachis, about 2 lines long, with a tuft of brown cilia at its base. Outer glume broad, rigid, faintly 5-nerved, notched at the end, with 2 prominent membranous wings, 2nd glume keeled and tapering to a fine point or very short awn, 3rd thin, almost hyaline with a palea as long and not thinner and 3 stamens, 4th terminal glume very thin and hyaline, bifid, the awn twice or three times as long as the spikelet. Pedicellate spikelet smaller, reduced to two membranous glumes, the outer one broad and rather obtuse, the inner narrow, tapering to a point.

Queensland. Endeavour River, *Banks and Solander*.

10. **I. laxum**, *R. Br. Prod.* 205.—A rather slender grass of 2 to 3 ft., the Australian specimens quite glabrous. Leaves narrow, often subulate, the ligula short, ciliate. Spike single, dense, sometimes slightly curved, 2 to 4 or rarely 5 in. long; rhachis and pedicels ciliate. Sessile spikelet narrow, scarcely flattened, 3 to 4 lines long; outer glume acutely acuminate, with 2 rather prominent nerves and obscure ones between them; 2nd glume thin, produced into a long fine straight awn; 3rd hyaline, with a male flower; terminal glume hyaline, narrow, bifid, with a long bent awn. Pedicellate spikelet more conspicuous, much flattened as well as the pedicel. Glumes acutely acuminate, the outer one broadly lanceolate, with 5 very prominent nerves, the 2nd thin, scarious, faintly 3-nerved, two flowering glumes and paleas thin and hyaline, both with male flowers or the 3rd empty.—*Andropogon nervosus*, Rottb.; Kunth, Enum. i. 507; *Hologamium nervosum*, Nees in Edinb. N. Phil. Journ. xviii. 185.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; main land of the gulf, *Landsborough*; Victoria River, *P. Mueller*; Port Darwin, *Schultz*, n. 10; Arnhem's Land, *M. Kinlay*.

Queensland. Peak Downs, *Burkitt*; Rockhampton and neighbourhood, *Bowman*, *Thozet*, *O'Shauesy*; also in *Leichhardt's* collection.

The species extends over tropical Asia and Africa.

26. DIMERIA, R. Br.

Spikelets 1-flowered, almost sessile, inserted singly on the alternate notches of slender unilateral spikes, which are either solitary or more frequently 2 or 3 together on a terminal peduncle; the rhachis not articulate, and frequently a tuft of short hairs under each spikelet.

Glumes 4, 2 outer empty ones linear, rigid, keeled, not awned, the 3rd also empty but smaller, thin and hyaline; terminal glume thin and transparent, entire or 2-lobed, with a slender awn either terminal or in the terminal notch, twisted at the base and bent back at or below the middle. Palea minute or none. Styles distinct. Grain free, narrow, enclosed in the outer glumes.

A small genus extending over tropical Asia. Of the two Australian species one is also in East India, the other appears to be endemic.

Spikelets nearly 2 lines long, with a tuft of hairs at the base. Outer glumes rather thick. (Stamens 3?) . . . 1. *D. acinaciformis*.

Spikelets about 1 line long, without any or only a very minute tuft of hairs. Outer glumes thin. Stamens 2. 2. *D. tenera*.

1. ***D. acinaciformis***, *R. Br. Prod.* 204.—A slender annual, branching at the base, with filiform stems 6 in. to 1 ft. high. Leaves few near the base, narrow, ciliate with a few long hairs. Spikes 2, flat, the filiform flexuose rachis 1 to $1\frac{1}{2}$ in. long. Spikelets narrow-linear, nearly 2 lines long, with a prominent tuft of white hairs or cilia at their base. Outer glume rather thick, complicate, not bordered, the keel minutely serrate-ciliolate; 2nd glume rather longer, nearly as thick but bordered by a thin hyaline margin, the keel more prominent at the end. Terminal flowering glume very narrow and hyaline, shortly 2-lobed, distinctly keeled, the keel produced into a capillary twisted and bent awn of about $\frac{1}{2}$ in. Stamens 3 (*R. Brown*), all fallen away from the spikelets examined.

Queensland. Endeavour River, *Banks and Solander*.

2. ***D. tenera***, *Trin. in Mem. Acad. Petersb. ser. 6, ii. 225*.—A slender branching annual, with filiform stems 6 in. to 1 ft. high, erect or weak and decumbent. Leaves narrow, ciliate, the sheaths sprinkled with long spreading hairs, the ligula short, truncate. Spikes 2, filiform, 1 to $1\frac{1}{2}$ in. long. Spikelets about 1 line long, very narrow, without any or rarely an exceedingly minute tuft of hairs at the base. Glumes thinner than in *D. acinaciformis*, the outer one usually sprinkled with a few hairs and the 2nd shortly ciliate on the hyaline margins, the 3rd very small or perhaps sometimes deficient. Terminal flowering glume rather shorter than the outer ones, scarcely notched, the awn appearing quite terminal.—*D. psilobasis*, *F. Muell. Fragm. vii. 104*.

N. Australia. Port Darwin, *Schultz, n. 321*.

Widely spread over East India, from the Peninsula to Nepal and Mergui.

27. ARTHRAXON, Beauv.

(Batratherum, *Nees*.)

Spikelets 1-flowered, sessile in the alternate notches of the articulate rachis of simple spikes, with a short pedicel in the same notch usually

without any spikelet, the spikes sessile or shortly pedunculate in a simple terminal panicle. Glumes 4, the outer one the largest, membranous, several-nerved, the 2nd keeled, acute, the 3rd smaller, hyaline, all awnless, 4th or terminal glume shorter than the 2nd, hyaline but keeled, with a dorsal awn arising from the base but twisted and bent as in *Andropogon*. Palea very small and hyaline. Styles distinct. Grain enclosed in the outer glumes but free from them.—Stems usually weak or slender with short broad leaves.

The genus is generally spread over tropical Asia and Africa, the only Australian species apparently a slight variety of a common Indian one.

1. **A. ciliare**, Beauv. *Agrostogr.* 111, t. 11, f. 6, var. australe.—Stems slender, decumbent or creeping at the base, branching and ascending to about 1 ft. Leaves ovate-lanceolate, acute, 1 to 1½ in. long, cordate at the base, the sheaths usually ciliate with long hairs. Spikes usually 3 or 4, shortly pedicellate, forming a little simple panicle of about 1 in., the rhachis and abortive pedicels glabrous. Spikelets few, rarely above 6 in. each branch or spike about 2 lines long. Outer glume acute, with about 7 equally prominent more or less muricate nerves; keel of the 2nd glume ciliate towards the top; terminal or flowering glume obtuse, entire or very shortly 2-lobed, the dorsal awn proceeding quite from the base, fine and about twice as long as the spikelet.—*Batratherum echinatum*, Nees. in Edinb. New Phil. Journ. xviii. 181; *Andropogon echinatus*, Heyne in Steud. Syn. Glum. i. 382.

N. S. Wales. New England, C. Stuart.

Although evidently belonging to a common Asiatic species, these specimens do not precisely agree with the Indian forms. They are nearest to those named by Nees *Batratherum submuticum*, but never published by him under that name, though afterwards included in Steud. Syn. Glum. i. 382 as *Andropogon submuticus*. There are also several other Asiatic or African species nearly allied to it but apparently distinct. Amongst the numerous synonyms, however, cited by F. Muell. Fragm. viii. 119, there are several which belong to a very different plant, the *Ischemum ciliare*, Retz, which, as above mentioned, Kunth had confounded with the *Arthraxon ciliare*.

Var. ? *tenellus*. A single specimen from Tawomba, in Queensland, Bailey, consisting of numerous adventitious stems from the base of an old one, with small narrow leaves and the panicles reduced to single spikes of 1 to 5 spikelets, the nerves of the outer glumes much muricate, the awn very short or obsolete. Perhaps an abnormal state rather than a variety, but the habit very peculiar.

28. POLLINIA, Trin. not of Spreng.

Spikelets 1-flowered, in pairs in the alternate notches of the articulate rhachis of simple spikes, one sessile or shortly pedicellate, the other on a longer pedicel, but the two otherwise similar, the spikes sessile and clustered or rarely solitary at the end of the common peduncle. Glumes 4 or 3, outer one the largest, membranous, awnless with a truncate toothed or ciliate tip, 2nd usually thinner, keeled, acute

or produced into a fine straight awn, 3rd thin and hyaline or deficient; terminal or 4th glume a twisted and bent awn, contracted and flexuose or hyaline, dilated and 2-lobed at the base as in *Andropogon*. Palea small and hyaline or none. Styles distinct. Grain enclosed in the outer glumes and free from them.—Habit of *Andropogon*, sect. *Gymnandropogon*, the spikes silky-villous, rufous or silvery-white as in *A. sericeus* and its allies, but the pedicellate spikelets are all except sometimes at the base of the spike fertile, which is never the case in *Andropogon*.

The genus extends over tropical Asia and Africa, and of the five Australian species only one appears to be endemic.

Third glume very small and hyaline or none. Awn contracted at the base into a narrow flexuose stipes.

Spikes several, often numerous. Spikelets both pedicellate, 2nd glume with a fine straight awn. Awn of the terminal glume long.

Annual. Spikes $1\frac{1}{2}$ to 2 in. long 1. *P. articulata*.

Perennial. Spikes 3 to 5 in. long 2. *P. irritans*.

Spikes 2 or 3. Spikelet sessile; 2nd glume not awned.

Awn of the terminal glume short and fine 3. *P. fulva*.

Third glume not much shorter than the 2nd, thin and hyaline. Awn with a narrow hyaline 2-lobed dilatation at the base.

Spikes 3 to 4 in., spikelets $1\frac{1}{2}$ lines, awns scarcely $\frac{1}{2}$ in. long 4. *P. tristachya*.

Spikes about 5 in., spikelets nearly 3 lines, awn 1 to $1\frac{1}{2}$ in. long 5. *P. Mackinlayi*.

1. ***P. articulata*, Trin. in Mem. Acad. Petersb. ser. 6, iii. 90.**—Closely allied to *P. irritans*, but smaller and more slender and apparently annual, 6 in. to $1\frac{1}{2}$ ft. high. Leaves very narrow, flat or filiform. Spikes usually several, sometimes numerous, slender, $1\frac{1}{2}$ to 2 in. long, the rhachis articulate but not breaking so readily as in some species. Spikelets exceedingly deciduous, under 1 line long, both pedicellate but one pedicel longer than the other, the rhachis and pedicels shortly ciliate. Outer glume obtuse, rather broad, faintly nerved, ciliate, 2nd glume rather narrow, obtuse but the keel produced into a fine straight awn; 3rd glume deficient (or very minute?). Awn or 4th glume contracted at the base into a flexuose stipes without any hyaline dilatation, ciliate in the lower twisted part, attaining 2 in. in the larger specimens. No palea.—*Erianthus articulatus*, F. Muell. Fragm. viii. 118; *Pogonatherum contortum*, Brongn. in Duperr. Voy. Bot. 90, t. 17.

N. Australia. Port Essington, *Armstrong*; Port Darwin, *Schultz*, n. 146.

Var. *minor*. Spikes 2 to 4, scarcely above 1 in. long.

Queensland. Rockingham Bay, *Dallachy*.

The species is also in the Malayan Archipelago.

2. ***P. irritans*, Benth.**—Stems 2 ft. high or more. Leaves usually

long and narrow, glabrous as well as the nodes. Spikes several usually numerous, 3 to 5 in. long, in a terminal cluster with a very short common rhachis, the slender rhachis of the spikes as well as the pedicels shortly ciliate. Spikelets both pedicellate but one pedicel longer than the other, about 1 line long. Outer glume rather broad, obtuse and more or less toothed at the end, the nerves faint except a more prominent one near each margin; 2nd glume narrow, the keel produced into a fine straight awn, 3rd very small and hyaline. Awn or terminal glume about 2 in. long, contracted at the base into a flexuose stipes without any hyaline dilatation, twisted and ciliate in the lower half. No palea.—*Saccharum irritans*, R. Br. Prod. 203; *Erianthus irritans*, Kunth, Enum. i. 479; F. Muell. Fragm. viii. 118.

Queensland. Keppel Bay, *R. Brown*; Endeavour River and Cleveland Bay, *A. Cunningham*; Cape York, *Daemel*; Rockingham Bay, *Dallachy*.

Var. ? *myriantha*. Spikes about 20 in the cluster. Spikelets very numerous and small, with shorter and finer awns, but not otherwise different from the typical form.

N. Australia. Arnhem's Land, *M'Kinlay*.

3. P. fulva, Benth.—Stems either slender and 1 to 1½ ft. high, or stouter more branching at the base and attaining 2 to 4 ft., the nodes glabrous or shortly bearded. Leaves rather narrow tapering to fine points, the orifice of the sheaths and ligula usually ciliate and sometimes the sheaths hairy. Spikes 2 or 3 sessile and near together in a terminal cluster but not quite digitate, 1½ to 2½ in. long, covered with silky hairs of a rich brown. Spikelets mostly about 2 lines long, but variable in size, all similar or the pedicellate ones rather narrower. Outer glume truncate or denticulate at the end, faintly nerved, 2nd nearly as long, narrower, slightly keeled, truncate, 3rd very minute or more frequently entirely deficient. Awn or terminal glume slender, rarely ½ in. long, contracted into a flexuose stipes or slightly dilated at the base, hyaline and bifid. Styles very shortly united.—*Saccharum fulvum*, R. Br. Prod. 203; *Erianthus fulvus*, Kunth, Enum. i. 479; F. Muell. Fragm. viii. 118.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Dampier's Archipelago, *A. Cunningham*; Port Darwin, *Schultz*, n. 466.

Queensland. Shoalwater, *R. Brown*; Rockhampton, *O'Shanesy*, and various localities in South Queensland, *Leichhardt* and many others.

N. S. Wales. Liverpool Plains, *C. Moore*; Darling River to Coopers' Creek, *Neilson*.

S. Australia. On the Murray near Morunda, *F. Mueller*; near Lake Eyre, *Andrews*; Lake Amadeus and Charlotte Waters Central Australia, *Giles*. Several of the latter specimens with the base of the awn rather more conspicuous hyaline and bifid, but still very narrow.

W. Australia, Murchison River, *Oldfield*.

This species at first sight much resembles the East Indian *Erianthus aureus*, Nees, (including *Pollinia Cumingii*, Nees, or *Erianthus Cumingii*, F. Muell. and other synonyms), but that has the outer glumes differently shaped and the inner ones much more developed.

4. **P. tristachya**, *Thw. Enum. Ceyl. Pl.* 368.—Stems 2 to 3 ft. high or sometimes more, the nodes not bearded. Leaves narrow, often sprinkled with a few long hairs and ciliate at the orifice of the sheaths. Spikes usually more than 3 and sometimes many, clustered at the end of the peduncle, 3 to 4 in. long, slender, the silky hairs of the rhachis and pedicels shorter than the spikelets. Spikelets about $1\frac{1}{2}$ lines long, the sessile and pedicellate ones similar. Outer glume membranous, truncate or 2-toothed, faintly nerved, bordered by long cilia, 2nd narrower, scarcely ciliate, 3rd nearly as long, almost acute. Awn or terminal glume fine, scarcely $\frac{1}{2}$ in. long, the hyaline base very narrow with small narrow terminal lobes.—*Erianthus Roxburghii*, F. Muell. *Fragm.* viii. 117.

Queensland. Rockingham Bay, *Dallachy*.

Common in East India, our specimens agreeing precisely with some from Ceylon and others from Khasya, etc.

5. **P. Mackinlayi**, *F. Muell. Herb.*—Apparently tall, but the lower part of the plant not seen, the upper leaf erect, with a long sheath slightly pubescent. Spikes 4 or 5, scarcely out of the sheath in the specimens seen, about 5 in. long, the spikelets almost concealed under the long silvery-silky hairs of the rhachis and pedicels. Spikelets nearly 3 lines long, the sessile and pedicellate ones similar. Outer glume membranous, scarcely nerved but thickened in the centre, densely ciliate in the middle with long hairs but glabrous above them, the 2nd narrower and thinner, the margins slightly ciliate, 3rd hyaline but not much shorter. Awn or terminal glume 1 to $1\frac{1}{2}$ in. long, the hyaline base with narrow acute lobes.—*Erianthus villosus*, F. Muell. *Fragm.* viii. 118.

N. Australia. North Coast of Arnhem's Land, *M'Kinlay*.

The East Indian *P. villosa*, Munro, differs in the fewer less silky spikes, the smaller spikelets with the outer glume much more rigid and prominently nerved without the dense dorsal cilia, and the awns much shorter.

29. ANDROPOGON, Linn.

(*Gymnandropogon*, *Cymbopogon* and *Schizachyrium*, *Nees*.)

Spikelets 1-flowered or empty, in pairs in the alternate notches of the articulate rhachis of simple spikes, 1 sessile hermaphrodite (or rarely female?) and fertile the other pedicellate and barren either male or empty, the spikes either solitary or clustered and sessile or very shortly pedunculate at the end of the common peduncle. Glumes in the fertile spikelet 4, the outer one the largest, awnless, several-nerved, but often 2 nerves near the margin much more prominent than the others; 2nd glume keeled, rarely produced into a short straight awn, 3rd much smaller, very thin and hyaline, always empty, 4th or

terminal glume under the flower very slender flexuose and stipes-like at the base or if dilated very thin and hyaline, entire or bifid at the top, with an awn either terminal or from the notch, rigid and twisted in the lower part, bent back and very fine above the middle. Palea small and hyaline or none. Glumes of the barren spikelets 4 or fewer, the outer one the largest and many-nerved, the 2nd keeled, the 3rd and 4th when present small thin and hyaline, all awnless. Styles distinct. Grain enclosed in the glumes but free from them.—Grasses usually tall and often scented, simple or paniculately branched.

A large genus, generally spread over the warmer regions of the globe, with a few extratropical species both in the northern and southern hemispheres. Of the fifteen Australian species three are widely spread over the warmer regions of the Old World, one of them extending into Europe, a fourth is at least in New Caledonia and the Philippines, the remainder are chiefly if not entirely endemic. It is not improbable however that when the Asiatic species come to be more carefully worked up some others may be found to be too closely connected with Australian ones if not absolutely identical.

SECTION I. **Gymnandropogon**.—Spikes 2, 3 or more, clustered at the end of a peduncle without sheathing bracts, very rarely reduced to a single spike.

Spikelets concealed or nearly so under copious long silky hairs.

Spikes about 3 in., spikelets about 3 lines long 1. *A. erianthoides*.

Spikes not above 2 in., spikelets scarcely 2 lines long.

Long silky hairs on the back of the outer glumes as well as on the rhachis and pedicels 2. *A. sericeus*.

Long silky hairs only or chiefly on the rhachis and pedicels.

Glumes not pitted 3. *A. affinis*.

Outer glumes marked with a pit on the back 4. *A. pertusus*.

Spikes silky-hairy, but the hairs not covering the spikelets.

Spikes 3 or 4 in a close cluster. Outer glumes obtuse or toothed 5. *A. annulatus*.

Spikes 4 to 8 in a close cluster. Outer glumes acute 6. *A. Ischæmum*.

Spikes numerous, the common axis elongated 7. *A. intermedius*.

SECTION II. **Cymbopogon**. Spikes 2 together on each peduncle within or above a sheathing bract.

Spikes both sessile at the end of the peduncle. Awns slender short and glabrous or deficient.

Silky hairs long, concealing the spikelets or nearly so.

Spikes erect. Awns prominent.

Leaves long and broad. Stems tall and stout 8. *A. procerus*.

Leaves flat, narrow. Spikes densely woolly 9. *A. lanatus*.

Leaves wholly subulate or very narrow, tapering into long subulate points. Spikelets small 10. *A. exaltatus*.

Spikes at length spreading or reflexed. Awns none or very fine and scarcely projecting 11. *A. bombycinus*.

- Hairs much shorter than the spikelets. Spikes divaricate usually shortly awned 12. *A. schœnanthus*.
Hairs minute. Spikes soon reflexed. Awns very short or none 13. *A. refractus*.
One spike affixed lower down than the other, slightly hairy. Awns 1 to 3 in. long, hairy in the lower part . . . 14. *A. lachnatheris*.

SECTION III. **Schizachyrium**.—*Peduncles axillary or terminal, bearing each a single spike above a narrow sheathing bract.*

- Rhachis and pedicels shortly ciliate, a small oblique bract at each notch 15. *A. fragilis*.

SECTION I. **GYMNANDROPOGON**.—Spikes 2, 3 or more, clustered at the end of an elongated peduncle without sheathing bracts, very rarely reduced to a single spike.

Among the following species those with densely silky-hairy spikes approach *Pollinia* in habit, but the pedicellate spikelet is always barren and awnless, and most frequently without even a male flower.

1. **A. erianthoides**, *F. Muell. Fragm.* x. 75.—An erect glaucous grass of 2 or 3 ft., glabrous except the inflorescence, the nodes not bearded. Leaves rather narrow. Spikes usually 3 or 4, nearly sessile at the end of a peduncle without sheathing bracts, erect or scarcely spreading, about 3 in. long, the spikelets concealed under the very copious long silky hairs surrounding the sessile spikelet on the pedicels and a few on the outer glumes. Sessile spikelet about 3 lines long, the outer glume nearly equally many-nerved, with a short scarious often notched tip; 2nd glume rather shorter, keeled, 3-nerved, acute, 3rd thin and hyaline; awn or terminal glume fine, not above twice the length of the spikelet, contracted at the base into a flexuose stipes, with sometimes a very slight hyaline dilatation. Pedicellate spikelet reduced to 1 or 2 empty glumes.

Queensland. Peak Downs, *F. Mueller*; Darling Downs, *Leichhardt*; Spring-sure, *Wuth.*

N. S. Wales. Maneroo, *Woolfs.*

2. **A. sericeus**, *R. Br. Prod.* 201.—Stems erect, branching at the base, usually rather slender and 1 to 2 ft. high, with narrow leaves chiefly at the base, but sometimes twice that height with larger leaves, the nodes bearded. Spikes in the typical form 2 or 3 or rarely twice as many, sessile at the top of a slender peduncle without sheathing bracts, all 1 to 2 in. long and densely clothed with long silky hairs on the outer glumes as well as on the rhachis and pedicels. Spikelets scarcely 2 lines long, the pedicellate one reduced to a many-nerved silky-hairy glume enclosing a second small hyaline lanceolate one. Outer glume of the sessile spikelet rather rigid, obtuse or nearly so, about 5-nerved, with long silky hairs on the back and a short scarious ciliate tip; 2nd glume keeled, acute, glabrous; 3rd very small broad thin and hyaline; awn or terminal glume $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, without any hyaline dilatation at the base.—*A. chrysatherus*, *F. Muell. in Linnæa*,

xxv. 443; *A. annulatus*, F. Muell. Fragm. viii. 123, but not of Forsk.

Queensland. Keppel Bay, *R. Brown*; Cape York, *Daemel*; Port Curtis, *M. Gilliray*; Moreton Bay, *A. Cunningham*, *F. Mueller* and others; Condamine River, etc., *Leichhardt*; Rockhampton and other localities in South Queensland, *O'Shanesy* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolfs* and others; New England, *C. Stuart*; Macleay River, *Beckler*; Liverpool Plains, *C. Moore*; near Bathurst, *A. Cunningham*; between the Darling and the Western frontier, *Dallachy* and others.

S. Australia. Rocky Creek and Crystal Brook, *F. Mueller*; Lake Eyre, *Andrews*; Lake Amadeus, *Giles*.

W. Australia. *Drummond*, n. 986.

Also in New Caledonia and the Philippines.

Var. *polystachyus*. Usually a larger plant with 10 to 30 or even more spikes of $1\frac{1}{2}$ to 2 in., all closely sessile in a terminal head, the long silky hairs and structure of the spikelets precisely as in the typical form.

N. Australia. Victoria River and Sturt's Creek, *F. Mueller*; Albert River and Sweers Island, *Henne*; Escape Cliffs, *Hulse*.

Queensland. Port Denison, *Fitzalan*; Burdekin River, *Bowman*; Rockhampton, *O'Shanesy*.

3. *A. affinis*, *R. Br. Prod.* 201.—Very near *A. sericeus* and perhaps a variety, with the same habit, the nodes less bearded and sometimes quite glabrous. Spikes usually 3 or 4, not quite sessile, $1\frac{1}{2}$ to 2 in. long, the spikelets rather longer and narrower than in *A. sericeus* and not so closely imbricate, the long silky spreading hairs only on the pedicels and at the base of the sessile spikelets, not on the backs of the glumes, the 3rd glume more developed in the spikelets examined; the awn $\frac{3}{4}$ to $1\frac{1}{2}$ in long.

Queensland. Keppel Bay, *R. Brown*; Moreton Bay, *Leichhardt*, *C. Stuart*, *Bailey*.

N. S. Wales. Port Jackson to the Blue Mountains, *Woolfs*.

W. Australia. Fraser's Range, *Dempster*, the specimens apparently belonging to this rather than to the typical *A. sericeus*.

4. *A. pertusus*, *Willd.*; *Kunth, Enum.* i. 498.—Stems slender, 1 to 2 ft. high, the nodes glabrous. Leaves chiefly at the base of the stem, narrow, glabrous. Spikes 2 to 5, sessile or nearly so at the end of the peduncle without sheathing bracts, 1 to 2 in. long, silky-hairy as in the preceding species, with long hairs on the pedicels and at the base of the sessile spikelets. Spikelets fully 2 lines long, rather obtuse, the outer glume marked above the middle with a small pit which assumes inside the appearance of a projecting gland. Awn slender, about $\frac{3}{4}$ rarely 1 in. long. Pedicellate spikelet usually containing a male flower.—*R. Br. Prod.* 201.

Queensland. East Coast, *R. Brown*; Dawson River, *F. Mueller*; Brisbane River, *Bailey*; Rockhampton, *Thozet*, *O'Shanesy*.

N. S. Wales. Mudgee, *Taylor*.

Widely spread over tropical Asia.

5. **A. annulatus**, *Forsk.*; *Kunth, Enum.* i. 498.—Stems from a tufted base ascending to about 2 ft., the nodes glabrous or slightly bearded. Leaves narrow, usually glaucous. Spikes 2 or 3, nearly sessile at the end of the peduncle without sheathing bracts, $1\frac{1}{2}$ to 2 in. long, the pedicels and base of the sessile spikelets much less ciliate than in the preceding species. Spikelets about 2 lines long. Outer glume of the sessile one membranous, prominently many-nerved, obtuse or 3-toothed, ciliate on the margin and with a few long hairs on the back at the top; 2nd glume thin, the midrib alone prominent, 3rd very thin and hyaline; awn or terminal glume $\frac{1}{2}$ to $\frac{3}{4}$ in. long, without any hyaline dilatation at the base. Pedicellate spikelet nearly similar but awnless, and with a male flower or reduced to empty glumes.

N. Australia. Upper Victoria River, *F. Mueller*.

Queensland. Rockhampton, *O'Shanesy*; East tropical Australia, *F. Mueller*.

Widely spread over tropical Asia and Africa.

Var? *monostachya*, *F. Muell.*—Spike single. Sessile spikelets rather longer than in the typical form, the outer glume with fewer nerves and much more ciliate with long hairs.—Victoria River, *F. Mueller*; Nerkool Creek, *Bowman*.

Var? *humilis*. A dwarf plant with 4 to 6 spikes shorter than in the typical form.—Charlotte Waters, Central Australia, *Giles*.

6. **A. Ischæmum**, *Linn.*; *Kunth, Enum.* i. 499.—An erect grass of $1\frac{1}{2}$ to 2 ft., branching and leafy at the base, quite glabrous, the nodes not bearded in any of our specimens. Leaves narrow, mostly erect, the upper ones few, with long sheaths and short laminæ. Spikes usually 4 to 8, very shortly pedicellate at the end of the peduncle without sheathing bracts, mostly $1\frac{1}{2}$ to 2 in. long, rather slender, with spreading hairs only on the pedicels and at the base of the sessile spikelets. Spikelets scarcely 2 lines long, usually of a purplish colour, the outer glume several-nerved, acute or slightly notched, 2nd glume keeled and acute; 3rd lanceolate and hyaline, but much more developed than in *A. sericeus*; awn or terminal glume $\frac{1}{2}$ to $\frac{3}{4}$ in. long, without any hyaline dilatation at the base. Pedicellate spikelet with a male flower or reduced to two empty glumes, the 2nd thin one not much shorter than the outer one.—*F. Muell. Fragm.* viii. 122; *Reichb. Ic. Fl. Germ.* t. 54.

W. Australia, *Drummond*; Fraser's Range, *Dempster*.

Common in southern Europe and temperate and subtropical Asia. The above Australian specimens are so much like European ones as to suggest the possibility of their being introduced. The species is chiefly distinguished from its nearest allies by the acuteness of the spikelets. Some specimens from Murchison River, *Oldfield*, seem to agree in this respect, but the outer glume is sometimes pitted and they may be a variety of *A. intermedius* with a reduced inflorescence.

7. **A. intermedius**, *R. Br. Prod.* 202.—An erect grass of 2 ft. or more, with the narrow leaves and general habit of *A. Ischæmum*, the nodes varying with or without beards. Spikes slender, 1 to $1\frac{1}{2}$ in. long,

usually numerous, all shortly pedicellate in an oblong terminal panicle of 3 or 4 in. without sheathing bracts, the common rhachis glabrous and always more or less elongated, the pedicels and base of the sessile spikelets more or less ciliate. Spikelets under 2 lines long, narrow and acute or scarcely obtuse and often purplish as in *A. Ischæmum*. Outer glume often, but not always even in the same spike, marked with a dorsal pit as in *A. pertusus*. Awn small and slender. Pedicellate spikelet more developed than in *A. Ischæmum*, and often enclosing a male flower.—*A. inundatus*, F. Muell. in Linnæa, xxv. 444.

N. Australia. Victoria River and Sturt's Creek, F. Mueller.

Queensland. Keppel Bay, R. Brown; Port Denison, Fitzalan; Brisbane River, Moreton Bay, F. Mueller, Bailey; Rockhampton and numerous localities in South Queensland, Thozet, Bowman and others.

N. S. Wales. Mudgee, Taylor.

S. Australia, Crystal Brook, F. Mueller.

W. Australia, Drummond, the specimens very imperfect and perhaps wrongly referred. The species appears however to be generally spread over Australia, intermediate in some respects between *A. Ischæmum* and *A. pertusum*, it is readily distinguished in the section by the loose inflorescence with the elongated common rhachis.

SECTION II. CYMBOPOGON.—Spikes 2 together on each peduncle within or above a sheathing bract, forming usually a terminal leafy panicle.

8. **A. procerus**, R. Br. Prod. 202.—Stems stout, erect, 3 to 5 ft. high or even more. Leaves long, the lower ones $\frac{1}{4}$ to $\frac{1}{2}$ in. broad with long sheaths, all glabrous, the ligula broad and jagged. Panicle 6 in. to above 1 ft. long, narrow, dense, with very numerous short branches, the linear acuminate erect sheathing bracts mostly longer than the spikes. Peduncles short, each with a sheathing bract about the middle and 2 erect spikes rarely $\frac{1}{2}$ in. long, the long white hairs concealing the spikelets. Sessile spikelets usually 3, narrow, scarcely 2 lines long; outer glume flattened on the back with 2 prominent nerves not far from the margin and usually 3 fainter ones between them; the 2nd glume narrow, keeled and pointed, 3rd short, very thin and hyaline; awn or terminal glume usually above $\frac{1}{2}$ in. long with a narrow bifid hyaline base. Outer glume of the barren pedicellate spikelets many-nerved.

N. Australia. Groote Island, R. Brown; Upper Victoria River, F. Mueller; Port Darwin, Schultz, n. 60, 147, 150, 241, 262.

This and the two following species are certainly very closely allied, but the differences chiefly in foliage appear to be constant. *A. procerus* is also remarkable for its smaller spikelets, *A. lanatus* for the denser wool of the spikes, all three differ from *A. bombycinus* in their erect spikes and much longer awns. F. Mueller, Fragm. viii. 124, unites them all, including *A. bombycinus*, with the *A. laniger*, Desf. of the Mediterranean region, a view in which I am unable to concur.

9. **A. exaltatus**, R. Br. Prod. 202.—Stems erect, sometimes scarcely

1 ft. high in southern specimens, above 3 ft. in some of the northern ones. Leaves very narrow, all ending in long subulate points and in the smaller specimens subulate from the sheath, the ligula long and scarious. Nodes usually glabrous. Panicle sometimes short and dense, sometimes long and interrupted. Spikes 2 or very rarely 3 together, $\frac{1}{2}$ to 1 in. long, erect, densely hairy, the common peduncles short with a sheathing bract as in the allied species. Spikelets $2\frac{1}{2}$ to 3 lines long, the 2 prominent nerves of the outer glume almost winged, with 3 to 5 less conspicuous nerves between them. Awns $\frac{1}{2}$ to 1 in. long.

N. Australia. Islands of the North Coast, *R. Brown*; Sturt's Creek, *F. Mueller* Dampier's Archipelago, *A. Cunningham*, *Walcot*.

S. Australia. Torrens River, Crystal Brook, Flinders Range, *F. Mueller*; Lake Eyre, *Andrews*.

W. Australia, *Drummond*, n. 100; Murchison River, *Oldfield*; Ningham country, *Monger*.

10. ***A. lanatus*, R. Br. Prod. 202.**—An erect grass of 2 or 3 ft. or more, with the habit inflorescence and erect spikes of *A. exaltatus*, but the leaves though narrow usually flat, and the spikes very densely woolly-hairy almost as in *A. bombycinus*. Awns $\frac{1}{2}$ to 1 in. long.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Port Essington, *Armstrong*.

Queensland. Albany, *F. Mueller*; Rockingham Bay, *Dallachy*; Mount Wheeler, *Thozet*.

11. ***A. bombycinus*, R. Br. Prod. 202.**—An erect rigid perennial grass of $1\frac{1}{2}$ to 3 ft., usually glabrous except a little silky pubescence on the lower leaf-sheaths, the nodes glabrous or shortly bearded. Leaves narrow, flat, rather rigid, the ligula very prominent, entire. Panicle shortly branched, 3 to 6 in. long, with sheathing bracts of 1 to 2 in. under the branches. Peduncles usually shorter than the bracts, bearing each a narrow sheathing bract and 2 very densely woolly-hairy spikes of $\frac{1}{2}$ to 1 in., at first erect but soon spreading or reflexed. Sessile spikelets 2 to 5, concealed by the silvery-silky hairs. Outer glumes acute, many-nerved but the 2 lateral nerves much more prominent, especially as the flowering advances and the intermediate ones becoming almost obliterated or visible only towards the end of the glume; 2nd glume thin, with a prominent keel produced into a short point, 3rd very thin, faintly 3-nerved; terminal flowering glume very thin and hyaline, shortly bifid, with a very fine awn scarcely exceeding the spikelet, or entire without any awn. Pedicellate spikelets reduced to a single narrow many-nerved glume of $2\frac{1}{2}$ to 3 lines.

Queensland. Broad Sound, *R. Brown*; Peak Downs, *Burkitt*; Condamine River, *Leichhardt*; Springsure, *Wuth*.

N. S. Wales. Abundant in the interior from the Murray, Darling and Lachlan to the western boundary, *A. Cunningham*, *Mitchell*, *Dallachy*, *Neilson* and others.

S. Australia. Lyndoch Valley, Gawler Town, Murray River, *F. Mueller*; Central Australia, *Giles*.

W. Australia. Swan River, *Drummond*, 1st coll. and n. 985; *Preiss*, n. 1842; Murchison River, *Oldfield*; Champion Bay, *Walcot*.

The densely silky-woolly spreading spikes and very short awn, readily distinguish this from the three preceding species.

12. ***A. schœnanthus***, *Linn.*; *Kunth*, *Enum.* i. 493, var. *Martini*.—Stems erect, not very stout, 2 to 5 ft. high. Leaves narrow, flat, glabrous, the ligula prominent and scarious. Panicle varying from short and dense to 1 or 1½ ft. long and loose but narrow, the lanceolate sheathing acute bracts under each branch mostly exceeding the spikes. Peduncles solitary within the last bract, each bearing a narrow sheathing bract and 2 sessile spikes, at first erect at length spreading, ½ to ¾ in. long, the rhachis and pedicels hairy, but the hairs short not covering the spikelets as in the preceding species. Sessile spikelets 3 to 5, about 2½ lines long; outer glume about 5-nerved, the 2 lateral nerves very prominent towards the end; 2nd glume thin, rigid, slightly keeled, with hyaline ciliate margins, 3rd very thin, hyaline and ciliate; terminal or flowering glume very narrow, hyaline, bifid, with a fine awn about twice as long as the spikelet. Pedicellate spikelet reduced to empty glumes, the outer one many-nerved.—*A. Martini*, *Roxb.*; *Kunth*, *Enum.* i. 494.

Queensland. Herbert's Creek, *Bowman*; Rockhampton, *O'Shanesy*.

Widely spread over tropical Asia. The typical form of the species the most common in India, with the awns very small or obsolete, has not yet been found in Australia.

13. ***A. refractus***, *R. Br. Prod.* 202.—A glabrous erect grass of about 2 ft., with the narrow leaves paniculate inflorescence and sheathing bracts of *A. schœnanthus*, and the spikes similarly 2 together about ½ in. long on short bracteate peduncles, but much more divaricate, soon reflexed, and glabrous except a small tuft of short hairs at the base of the sessile spikelets. Sessile spikelets 2 to 5, 2½ to 3 lines long; outer glume acute, many-nerved; 2nd narrow and keeled, 3rd thin and hyaline; terminal or flowering glume hyaline, narrow, either 2-lobed with an awn slightly exceeding the spikelet, or more frequently entire or nearly so and awnless. Pedicellate spikelets neuter or rarely with a male flower, the outer glume many-nerved.—*Sieb. Agrostogr.* n. 54.

N. Australia. Port Essington, *Armstrong*.

Queensland. Brisbane River, Moreton Bay, *C. Stuart*, *Bailey*; Wide Bay, *Bidwill*; Rockhampton, *O'Shanesy*; Herbert's Creek, *Bowman*; Warwick, *Beckler*.

N. S. Wales. Port Jackson, *R. Brown*, *Woolfs*; New England, *C. Stuart*.

Victoria. Mitta-Mitta, *F. Mueller*.

14. ***A. lachnatherus***, *Benth.*—Stems rather slender, erect, about 2 ft. high. Leaves narrow, glabrous or sprinkled with long hairs. Nodes not bearded. Panicle looser than in the preceding species with slender but not very long branches solitary or clustered within sheathing bracts or floral leaves. Peduncles exceeding the last

sheathing bracts bearing each 2 spikes but not digitate, one attached lower down than the other, each $\frac{1}{2}$ to $\frac{3}{4}$ in. long without the awns. Sessile spikelets 3 or 4, the lowest sometimes containing only a male flower, the others with a hermaphrodite flower, 2 to $2\frac{1}{2}$ lines long, slightly hairy. Outer glume obtuse, about 9-nerved, 2nd rather shorter, obtuse, 3-nerved, 3rd very narrow thin and hyaline; awn or terminal glume on a short filiform base, 1 to 2 in. long, the lower part rigid and hirsute with rufous hairs. Pedicellate spikelets narrow, acute, $2\frac{1}{2}$ to 3 lines long, usually containing a male flower, the outer glume many-nerved, often produced into a fine point.—*A. procerus*, F. Muell. Fragm. viii. 124, not of R. Brown.

Queensland. Islands of Moreton Bay, *F. Mueller*; Brisbane River, *Bailey*; Rockhampton, *O'Shanesy*; Nerkool Creek, *Bowman*.

N. S. Wales. Clarence River, *Beckler*.

SECTION III. SCHIZACHYRIUM.—Peduncles axillary or terminal, bearing each a single spike above a narrow sheathing bract.

15. *A. fragilis*, *R. Br. Prod.* 202.—A slender decumbent much-branched grass, attaining sometimes 2 ft. or more, usually glabrous. Leaves narrow, rather short, the upper ones passing into sheathing bracts. Panicle leafy, slender, secund, consisting of few spikes on very unequal slender peduncles, each with a narrow acute sheathing bract below the spike. Spike slender, 1 to $1\frac{1}{2}$ in. long, with a short hyaline obscurely cup-shaped bract enclosing each notch. Sessile spikelets about 2 lines long, very narrow; outer glume rigid but thin, faintly nerved, the 2 lateral nerves more prominent, 2nd glume keeled, acute, 3rd very thin and hyaline; terminal glume thin and hyaline, divided almost to the base into 2 narrow lobes, the awn between them shortly exerted. Pedicellate spikelets reduced to a single narrow empty glume, tapering into a fine awn, or sometimes in the terminal spikelets acute only.

N. Australia. Upper Victoria River, *F. Mueller*; Port Darwin, *Schultz*.

Queensland. Endeavour River, *Banks and Solander*.

30. IMPERATA, Cyr.

Spikelets with 1 or rarely 2 flowers, usually in pairs one sessile the other pedicellate along the slender continuous rhachis of the short branches of a long cylindrical spikelike panicle, densely silky with the long hairs surrounding and seated on the spikelets. Glumes 4, all thin hyaline and awnless, 2 outer empty ones usually hairy, the 3rd empty or rarely enclosing a flower smaller and without hairs; terminal flowering glume still smaller. Palca usually truncate and jagged at the top. Stamens 2, or 1 only in species not Australian. Styles distinct. Grain small, free, enclosed in the outer glumes.

Besides the Australian species which is widely spread over the temperate and tropical regions especially of the Old World, the genus contains at least one other, chiefly American.

1. **I. arundinacea**, *Cyr.*; *Kunth, Enum. i. 477.*—A stiff erect perennial 1 to 3 ft. high, glabrous except sometimes a tuft of hairs at the nodes, which however is not so common in Australian as in Indian specimens. Leaves erect, narrow, often longer than the stem. Spike-like panicle very dense, 3 to 8 in. long, regularly cylindrical, silvery white with the long silky hairs concealing the glumes, the dark coloured stigmas and oblong-linear anthers alone protruding. Spikelets $1\frac{1}{2}$ to near 2 lines long; outer glume 5- or 7-nerved, the 2nd 3- or 5-nerved, the 3rd usually empty.—*R. Br. Prod. 204*; *Host, Gram. Austr. iv. t. 40*; *Reichb. Ic. Fl. Germ. t. 55.*

N. Australia, Queensland, N. S. Wales, Victoria and S. Australia, apparently very common in all these colonies, being sent from a large number of stations by numerous collectors; Gulf of Carpentaria, Queensland Coast, Port Jackson and Port Lincoln, *R. Brown*.

Tasmania. *R. Brown* (*Prod.*), but no Tasmanian specimen in his herbarium.

W. Australia. Murchison River, where it rarely flowers, *Oldfield*.

In the majority of specimens, as is generally said of the species in Europe and Asia, the 3rd glume is empty, but in some from Macleay River, *Beckler*, I have seen the 3rd and 4th glumes nearly similar, each with a hermaphrodite flower in its axil.

31. **CHRYSOPOGON**, Trin.

(*Holcus*, *R. Br.* partly.)

Fertile spikelets 1-flowered, sessile between 2 pedicellate male or barren spikelets at the end of the filiform unequal simple or divided branches of a terminal panicle, with sometimes 1 to 3 pairs of spikelets on the branch below the terminal 3. Glumes of the fertile spikelets 4, the outer one the largest, awnless, membranous and many-nerved, or more rigid with the lateral nerves prominent and often mucicate; 2nd glume narrow, keeled, pointed or produced into a fine straight awn; 3rd much smaller, very thin and hyaline; 4th or terminal glume under the flower slender, flexuose and stipes-like at the base, or dilated hyaline and 2 lobed, with a short or long awn terminal or from between the lobes, twisted in the lower half and bent back above the middle as in *Andropogon*. Palea very small or none. Styles distinct. Grain enclosed in the glumes, but free from them. Pedicellate spikelets awnless, with reduced glumes and usually 1 male flower.

The genus extends over the tropical and temperate regions of the New as well as the Old World. Of the four Australian species one only appears to be endemic, the others extending into tropical Asia and one over nearly the whole area of the genus. They differ from *Andropogon* chiefly in inflorescence, but might not inappropriately be reunited with *Sorghum* in one genus, as originally proposed by Brown and acquiesced in by Beauvois.

Spikelets 3 to 5 lines long, 1 fertile and 2 pedicellate ones to each branch, 2nd glume of the fertile one awned. Awn of the terminal one long and rigid 1. *C. Gryllus*.

- Spikelets scarcely $1\frac{1}{2}$ lines long, 1 to 3 fertile Besides the pedicellate ones on each branch, 2nd glume awnless . . . 2. *C. parviflorus*.
 Spikelets $2\frac{1}{2}$ to 3 lines long, 3 to 5 fertile besides the pedicellate ones on each branch. Panicle narrow, usually compact.
 Panicle 3 to 4 in. long, 2nd glume of the fertile spikelet acute awnless . . . 3. *C. aciculatus*.
 Panicle 4 to 10 in. long, 2nd glume of the fertile spikelet shortly awned . . . 4. *C. elongatus*.

1. **C. Gryllus**, *Trin. Fund. Agrost.* 188, and in *Mem. Acad. Petersb. ser. 6, ii.* 317.—An erect glabrous grass of 2 to 4 ft. Leaves long and narrow, with a small ligula. Panicle loose and spreading, 3 to 6 in. long, of numerous capillary simple branches, mostly verticillate, of very unequal length, each bearing a single hermaphrodite spikelet sessile between 2 pedicellate male ones with a tuft of hairs at the base of the sessile one and on the pedicels. Sessile spikelet narrow, 3 to 4 lines long; outer glumes rigid, acute, 5- or 7-nerved, the lateral nerves more prominent and muricate or hispid, with a few short conical or rigid hairs, 2nd glume narrow, hispid only at the end, the keel produced into a fine straight awn, 3rd thin and hyaline; awn or terminal glume long rigid and twisted in the lower part, the hyaline base narrow with short lobes sometimes obsolete. Pedicellate spikelets 3 to 5 lines long, the outer glume membranous tapering into a short fine awn, the inner ones unawned.—*Andropogon Gryllus*, Linn.; Kunth, Enum. i. 504; Sibth. Fl. Græc. t. 67; F. Muell. Fragm. viii. 121; *Holcus Gryllus*, R. Br. Prod. 199.

N. Australia. Cygnet Bay, *A. Cunningham*; Victoria River, Sturt's Creek and Abel Tasman River, *F. Mueller*; in the interior, *M'Douall Stuart*; Gulf of Carpentaria, *Landsborough, Gulliver*.

Queensland. Keppel Bay, *R. Brown*; Port Denison, *Fitzalan, Dallachy*; Peak Downs, *Burkitt*; Rockhampton, *O'Shanesy*.

N. S. Wales. Between the Darling and Cooper's Creek, *Neilson*.

Central Australia. Alice Springs, *Giles*.

Widely spread over the tropical and warmer temperate regions of the Old World.

1 Var. *pallidus*. Spikelets rather larger with longer stouter awns.—*Holcus pallidus*, R. Br. Prod. 199; *Pollinia pallida*, Roem. et Schult. Syst. ii. 829; *Andropogon pallidus*, Kunth, Enum. i. 505.—Islands of the Gulf of Carpentaria, *R. Brown*, and several of the N. Australian specimens above quoted either belong to this variety or closely connect it with the common form.

2. **C. parviflorus**, *Benth.*—Stems 2 or 3 ft. high, the nodes usually but not always bearded. Leaves narrow, scabrous, glabrous or the lower sheaths pubescent or hairy. Panicle 4 to 8 in. long, with very numerous capillary branches mostly clustered and divided, the ultimate branches bearing in the typical form each a single hermaphrodite spikelet between 2 pedicellate male ones, the pedicels and base of the sessile spikelet ciliate. Spikelets scarcely $1\frac{1}{2}$ lines long. Outer glume acute, not awned, finely many-nerved. Awn capillary, 3 to 6 lines

long, without any basal dilatation.—*Holcus parviflorus*, R. Br. Prod. 199; *Andropogon micranthus*, Kunth, Enum. i. 504; *Anatherum parviflorum*, Spreng. Syst. i. 290; *Sorghum parviflorum*, Beauv. Agrost. 132; *Holcus cærulescens*, Gaudich. in Freyc. Voy. Bot. 411. t. 27; *Andropogon violascens*, Nees in Sieb. Agrostoth. n. 65, Steud. Syn. Glum. i. 396; *Chrysopogon violascens*, Trin. in Mem. Acad. Petersb. ser. 6, ii. 319; *Andropogon montanus*, Roxb.; Kunth, Enum. i. 506; F. Muell. Fragm. viii. 122; *Chrysopogon montanus*, Trin. in Spreng. Neu. Eutd. ii. 93, and in Mem. Acad. Petersb. ser. 6. ii. 317.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Keppel Bay, *R. Brown*; Port Curtis, *McGillivray*; Brisbane River, Moreton Bay, *F. Mueller*, *Leichhardt*; Rockhampton, *O'Shane*; Herbert's Creek, *Boorman*; Darling Downs, *Wuth*; Peak Downs, *Law*.

N. S. Wales. Port Jackson, *R. Brown*, *Woolfs*; Liverpool Plains, *A. Cunningham*; New England, *C. Stuart*; Clarence River, *Beckler*.

Victoria. Hume River, *F. Mueller*.

Var. *spicigera*. Ultimate branches of the panicle bearing one or two sessile spikelets below the terminal one, each accompanied by a pedicellate male.—Port Denison, *Fitzalan*; Brisbane River, *Bailey*, *Prentice*; Tweed River, *Guilfoyle*; Port Jackson, *R. Brown*.

The species appears to be generally dispersed in East India if the *A. montanus* be correctly referred to it, and is also in New Caledonia.

Schultz's specimens from Port Darwin, n. 198, show a tall plant with the habit of *C. elongatus*, but with the small spikelets and bearded nodes of *C. parviflorus*. Our specimen, however, has lost most of its spikelets and is not in a state for accurate determination.

3. *C. aciculatus*, Trin. Fund. Agrost. 188 and in Mem. Acad. Petersb. ser. 6, ii. 317; var. ? elatior.—In the typical form the stems from a shortly decumbent branching and leafy base are erect under 1 ft. high, with few long leaf-sheaths and short laminæ; in the Australian specimens the base is wanting, the stem is above 1 ft. high, the leaves rather more developed, with erect rigid laminæ. Panicle narrow, compact, 3 to 4 in. long, with numerous unequal filiform branches, each with 2 to 4 sessile hermaphrodite spikelets accompanied by pedicellate males, the pedicels not ciliate. Spikelets narrow, $2\frac{1}{2}$ to 3 lines long. Outer glume of the sessile spikelets with 2 muricate nerves, and the keel of the 2nd usually ciliate. Awn short and fine with a very slight basal dilatation.

N. Australia. Abel Tasman River, *F. Mueller*.

Sieber's specimens, Agrostotheca, n. 93, represent the typical *C. aciculatus* (*Andropogon aciculatus*, Retz; *A. acicularis*, Kunth, Enum. i. 505), with short leaves crowded at the base of the stem and panicle branches bearing a single sessile spikelet between two pedicellate ones, which is widely spread over tropical Asia and the Mascarene Islands, but these specimens may not be really Australian. F. Mueller's above described specimens at first sight look distinct, but a few Indian ones come very near to them in stature as well as in their rigid upper leaves.

4. *C. elongatus*, Benth.—An erect glabrous grass, branching at the base and attaining 3 or 4 ft. or even more, with long narrow leaves.

Panicle in the typical form erect, narrow, dense, 6 to 10 in. long, with very numerous capillary unequal clustered branches, each bearing 3 to 5 or rarely only 1 or 2 hermaphrodite spikelets sessile between 2 pedicellate male ones, the triplets sessile or very shortly pedicellate with a tuft of hairs under each fertile spikelet. Spikelets all narrow, acute, about 3 lines long. Outer glume of the fertile spikelet rigid, with 2 prominent lateral nerves more or less muricate, the intermediate nerves often very faint, 2nd glume narrow, with a muricate or shortly ciliate keel produced into a fine point or short awn, 3rd lanceolate, very thin and hyaline, often ciliate; awn very fine, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, with a narrow hyaline shortly 2-lobed base.—*Holcus elongatus*, R. Br. Prod. 200; *Andropogon elongatus*, Spreng. Syst. i. 287; F. Muell. Fragm. viii. 121.

N. Australia. Coen River, Gulf of Carpentaria, *R. Brown*; Albert River, *Landsborough*; Sweers Island, *Henne*.

Queensland. Cape York, *McGillivray*, *Daemel*.

Var. *filipes*. Leaves narrower, panicle looser with longer filiform branches and the whole panicle often shorter, the awns rather longer.—Endeavour River, *A. Cunningham*; Rockingham Bay, *Dallachy*; Balonne River, *Mitchell*; Rockhampton, *O'Shanesy*.

32. SORGHUM, Pers.

(*Holcus*, *Br.* partly.)

Fertile spikelet 1-flowered, sessile between 2 pedicellate male or barren ones, at the end of the simple or divided branches of a terminal panicle, with 1 to 5 pairs or triplets of spikelets below the terminal 3. Glumes on the fertile spikelets 4, the outer one the largest, awnless, lanceolate or broad, hard and shining, obscurely nerved, 2nd glume rather hard keeled and acute, 3rd glume shorter, very thin and hyaline, 4th or terminal glume very thin, hyaline and 2-lobed at the base, with an awn between the lobes twisted in the lower half bent above the middle as in *Andropogon*. Palea very small or none. Styles distinct. Grain enclosed in the hard and shining outer glumes, free from them.

The genus extends over the tropical and warm-temperate regions of the New and the Old World. Of the four species recorded as Australian one is perhaps an escape from cultivation, two extend into tropical Asia, the fourth is endemic. They are all allied to *Chrysopogon*, but the more persistent hardened spikelets in dense panicles give them a peculiar aspect readily recognised.

- | | |
|--|--------------------------|
| Nodes glabrous or scarcely pubescent. Fruiting spikelets lanceolate, nearly glabrous. Awn short and fine . . . | 1. <i>S. halepense</i> . |
| Nodes bearded. Fruiting spikelets lanceolate, $2\frac{1}{2}$ to 4 lines long, villous. Awn usually long. Ovary glabrous . . . | 2. <i>S. plumosum</i> . |
| Nodes bearded. Fruiting spikelets ovoid, 2 lines long, sometimes with a short conical apex, villous. Awn not very long. Ovary glabrous . . . | 3. <i>S. fulvum</i> . |
| Nodes glabrous. Fruiting spikelets lanceolate, about 4 lines long, villous. Awn very long. Ovary crowned by a tuft of hairs . . . | 4. <i>S. intrans</i> . |

1. **S. halepense**, *Pers. Syn.* i. 101.—Stems erect, varying from 2 or 3 to 8 or 10 ft. high, the nodes glabrous. Leaves long and flat, often rather broad, the midrib usually white and prominent. Panicle from 3 or 4 in. to above 1 ft. long, loose and often much branched. Fertile spikelets lanceolate, varying from 2 to above 3 lines long, pale coloured or scarcely purple, not rufous, with a few hairs at the base. Outer coriaceous glume faintly many-nerved, at length smooth and shining, 2nd glume rather smaller, 5-nerved, usually sprinkled with a few hairs; terminal glume hyaline, broad, ciliate, 2-lobed, the awn from the notch very fine and short, rarely nearly twice as long as the spikelet.—*Holcus halepensis*, Linn.; *Andropogon halepensis*, Sibth. Fl. Gr. i. 52, t. 68; Kunth, Enum. i. 502.

A Mediterranean species, much cultivated in some warm countries, of which I have seen single specimens from Brisbane, *Bailey*, Glendon, *Leichhardt*, Port Jackson, *Woolfs*? and West Australia, *Drummond*, probably all escapes from cultivation. *F. Mueller*, *Fragm.* viii, 119, comprises under *Andropogon halepensis* the three following *Sorgha* all certainly indigenous in Australia, but their aspect and characters appear to me to be sufficiently constant to retain them as distinct species.

2. **S. plumosum**, *Beauv. Agrost.* 132.—A tall grass closely resembling *S. halepense*, but with the nodes bearded with a dense tuft of hairs and the leaves much narrower. Inflorescence and structure of the spikelets the same, but the smaller branches, pedicels and spikelets more or less villous with hairs usually rufous, besides the dense tuft at the base of the sessile spikelets. Spikelets varying from $2\frac{1}{2}$ to 4 lines long, lanceolate as in *S. halepense*, but less flattened and usually narrower. Outer glume at first several-nerved, at length rigid, shining and apparently nerveless except 2 ciliate nerves near the top, often turning almost black when ripe. Awn often short and capillary, but usually longer and stouter than in *S. halepense*, though never so long as in *S. intrans*. Ovary glabrous.—*Holcus plumosus*, R. Br. Prod. 200; *Andropogon australis*, Spreng. Syst. i. 287.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Victoria River, *F. Mueller*; Port Darwin, *Schultz*, n. 188; Escape Cliffs, *Hulse*; Arnhem's Land, *McKinlay*.

Queensland. Port Curtis and Port Molle, *McGillivray*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*; Brisbane River, Moreton Bay, *F. Mueller*, *Leichhardt* and others; Rockhampton and numerous localities in South Queensland, *Bowman*, *Thozet* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *A. Cunningham*, *Woolfs* and others; New England, *C. Stuart*; Hastings, Macleay and Clarence Rivers, *Beckler* and others.

Victoria. Snowy River, *F. Mueller*.

Kunth's figure of *Andropogon tropicus*, Rev. Gram. t. 97, represents rather *S. plumosum* than *S. fulvum*. Most of the N. Australian and some of the Queensland specimens represent a var. *aristosa* *F. Muell*, with long narrow spikelets and long awns, but all closely connected with the common form. To this variety may probably be referred, from the short character given, *Andropogon comesus*, Spreng. Syst. i. 287, which sometimes comes near at first sight to some forms of *Chrysopogon Gryllus*, but has the hard broad spikelets characteristic of *Sorghum*.

3. **S. fulvum**, Beauv. *Agrost.* 164.—A tall not very stout grass attaining sometimes 6 to 8 ft., the nodes bearded with a dense tuft of hairs. Leaves narrow, with scabrous edges. Panicle loose, 4 to 8 in. long, the hairs of the pedicels and spikelets of a rich brown as in the darker specimens of *S. plumosus*, but the sessile spikelets only $1\frac{1}{2}$ to 2 lines long, ovate or shortly conical at the top, not much flattened and usually black and shining when ripe. Awn $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Ovary glabrous.—*Holcus fulvus*, R. Br. Prod. 199; *Andropogon tropicus*, Spreng. Syst. i. 287.

Queensland. Keppel Bay, *R. Brown*; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*.

Also in tropical Asia, from Ceylon to the Archipelago, S. China and Japan.

4. **S. intrans**, *F. Muell. Herb.*—General habit and foliage of the two preceding species, but the nodes glabrous and the long awns give the dense panicle a different aspect. Fertile spikelets about 4 lines long, nearly terete, obtuse, hard, smooth and shining, glabrous except at the tips, the pedicels covered with long rufous hairs. Outer glume with 2 dorsal protuberances at the end giving it a 3-toothed aspect. Awn rigid, 3 to 4 in. long, the dilated hyaline base not much shorter than the other glumes and broadly 2-lobed. Palea small. Ovary crowned by a dense tuft of hairs not observed in any other species.

N. Australia. Arnhem's Land, *F. Mueller*; Port Darwin, *Schultz*, n. 31, 149, 185; Lagrange Bay, *Hughan*.

33. ANTHISTIRIA, Linn.

(*Iseilema*, *Anders.*)

Spikelets 1-flowered or empty, 7 rarely 6 in a spike or cluster, 4 male or barren, either sessile or pedicellate in a whorl at the base of the hairy rhachis, 2 or sometimes 1 pedicellate and male or barren on the top of the rhachis with an intermediate sessile fertile one. Glumes in the barren spikelets usually 2, the outer one several-nerved, the inner thin and hyaline, in the male spikelets usually a 3rd smaller hyaline one; in the fertile spikelet glumes 4, the 2 outer ones nearly equal, usually rigid and coriaceous, the outer one obscurely 5- or 7-nerved, the 2nd with 2 prominent nerves the central one very faint, 3rd glume much smaller, very thin and hyaline; 4th very narrow and thin at the base, thickened into a long twisted awn usually bent above the middle. Palea very small and hyaline, sometimes scarcely conspicuous. Styles distinct. Grain free, enclosed in the hardened outer glumes.—Erect leafy branching grasses, the spikes or clusters singly pedunculate within sheathing bracts, or sessile in the bracts and collected many together in compound clusters forming short almost cyme-like panicles.

The genus is spread over the warmer regions of the Old World, extending into South Africa, the several species described as American being now referred to *Andro-*

pogon (*Cymbopogon*) *bracteatus*, Willd. Of the four Australian species one is a common Asiatic and African one, the other three appear to be endemic.

The 4 whorled barren spikelets sessile. Awn very long and rigid.

Spikelets in dense compound clusters, sessile within the bracts.

Bracts glabrous. Barren spikelets glabrous or sprinkled with long cilia. Fertile spikelet glabrous or shortly pubescent at the end

1. *A. ciliata*.

Bracts sprinkled with long spreading hairs. Spikelets nearly of *A. ciliata*

2. *A. frondosa*.

Spikelets with the surrounding barren ones on slender pedicels within the sheathing bracts. Barren spikelets glabrous. Fertile one densely villous with brown hairs

3. *A. avenacea*.

The 4 whorled barren spikelets pedicellate, all the spikelets glabrous. Awns very fine

4. *A. membranacea*.

A. fusculosa, F. Muell. Fragm. x. 75, from Port Curtis, C. Moore, is unknown to me. As far as the description taken from a fragmentary specimen goes, it appears to me to be very near *A. avenacea*, differing in the involucrel spikelets being 6 or 8 instead of 4.

1. *A. ciliata*, Linn.; Kunth, Enum. i. 481.—Stems 1 to 3 ft. high. Leaves narrow, glabrous or the sheaths hairy; ligula very short, sometimes ciliate. Spikes or clusters of spikelets not numerous, sessile or the lower ones pedunculate in a short terminal leafy panicle, the leafy bracts subtending each spike sheathing at the base and tapering into points longer than the cluster, the short rhachis bearded with long brown hairs. Spikelets narrow, 4 to 5 lines long, 4 male or barren sessile at the base of the bearded rhachis, 2 or 1 pedicellate at the top, glabrous or sprinkled with a few long hairs: outer glume the largest, acute, many-nerved, 2nd shorter, thin and 3- or 5-nerved, 3rd thin and hyaline. Fertile terminal spikelet glabrous or shortly pubescent at the end; outer glume broad, obtuse, rather thick, about 7-nerved, 2nd rigid, rather shorter and narrower, with 2 prominent lateral nerves and a faint central one, 3rd narrow-oblong, very thin and hyaline; awn or 4th glume very long and rigid, the attenuate base not dilated.—*A. australis*, R. Br. Prod. 200; Hook. f. Fl. Tasm. ii. 107, t. 156; F. Muell. Fragm. v. 207; *A. cæspitosa*, Anders. Monogr. Androp. 13, and, from the character given, *A. cuspidata*, Anders. l.c. 14.

Abundant throughout **Australia** and **Tasmania**, known everywhere as 'Kangaroo grass,' and sent from various localities by numerous collectors (*Sieber, Agrostoth.* n. 61, *Drummond*, n. 984, *Preiss*, n. 1843, *Schultz*, n. 158, 179; Port Jackson and Port Lincoln, *R. Brown*, etc.). Spread also over tropical Asia and Africa.

2. *A. frondosa*, R. Br. Prod. 200.—Very near *A. ciliata*, but upon a larger scale. Stems erect and branching, from 2 or 3 ft. to twice that height, frequently flattened under the lower nodes. Leaves glabrous or the upper sheaths ciliate. Leafy panicle dense, often nodding, the leafy bracts narrow, ciliate on the back with long spreading hairs, the outer ones 2 to 3 in. long. Spikes or clusters as in *A. ciliata*, with

the 4 involucrel spikelets sessile, the outer glume of the fertile spikelet very rigid, scarcely nerved, obtuse, pubescent at the top with short rigid hairs. Awn as long as or often longer than in *A. ciliata*. Many of the spikes reduced to the 4 involucrel barren spikelets surrounding a rudimentary one.

N. Australia. Islands off the north coast, *R. Brown*; Arnhem's Land, *F. Mueller*; Port Darwin, *Schultz*, n. 155, 180, 217.

3. A. avenacea, F. Muell. Fragm. v. 206.—Stems from a more or less silky-hairy or woolly base, 2 to 3 ft. high. Leaves very narrow, glabrous. Sheathing bracts narrow, membranous, glabrous, 1 to 2 in. long. Spikes or clusters all on rather long, slender, glabrous or ciliate peduncles within the last bract. Barren spikelets either reduced to a single several-nerved rigid glume with a small hyaline one inside, or more developed, enclosing a male flower, the four involucrel ones sessile. Fertile spikelets about 4 lines long, the rigid outer glumes, especially the lowest, densely villous with brown hairs. Awn long and rigid as in the two preceding species.—*A. basisericea*, *F. Muell. Fragm. v. 207*.

N. Australia. Upper Victoria River, *F. Mueller*.

Queensland. Brisbane River, *Bailey*; Condamine and Gwydir Rivers, etc., *Leichhardt*; Rockhampton and other localities in the southern districts, *O'Shanesy*, *Bouman* and others; Peak Downs, *F. Mueller*.

N. S. Wales. In the interior, Lachlan River, *Fraser*; Liverpool plains, *A. Cunningham*; from the Darling to Cooper's Creek, *Neilson*.

Central Australia, Gosse.

W. Australia. King George's Sound, *Baxter*; Swan River, *Drummond*, 1st coll.; Murchison River, *Oldfield*.

F. Mueller had at first distinguished the western plant by the silky-hairy base of the stem or lowest sheaths, which has since proved to be also in the eastern specimens. The species is probably referrible to the section *Androscepia*, proposed as a genus by Brongniart for the *Anthistiria gigantea*, Cav.

4. A. membranacea, Lindl. in Mitch. Trop. Austr. 88.—Quite glabrous, sometimes forming dense leafy tufts of 6 in., the branching stems often elongated to 1 or 2 ft. Leaves flat, appearing almost articulate on the short flat prominently striate sheaths. Floral leaves or bracts with coriaceous sheaths and short lanceolate laminæ. Panicles small, dense, almost cyme-like as in *Apluda*, with very numerous small spikes or clusters, each subtended by a scarcely longer bract. Spikelets scarcely 2 lines long, glabrous, the four involucrel ones pedicellate, the fertile one rather longer than the 2 pedicellate barren ones beside it. Glumes all thin, the outer one acute with several green nerves, the second with 1 or 3 nerves, the awn very fine, scarcely more than as long again as the spikelet.—*F. Muell. Fragm. v. 207*; *Iseilema Mitchellii*, *Anders. Monogr. Androp. 24*.

N. Australia. Sturt's Creek, *F. Mueller, Gregory*; Nichol Bay, *Mrs. Crouch*.

Queensland. On the Narran, *Mitchell*; Peak Downs, *F. Mueller*; Barcoo, *Wuth.*

N. S. Wales. Between the Darling and Cooper's Creek, *Neilson*.

Central Australia, *Giles*; near Lake Eyre, *Andrews*.

Var. *trichopus*. A tuft of long hairs under the fertile spikelet.—Hooker's Creek, *F. Mueller*.

34. APLUDA, Linn.

Spikelets with 1 fertile flower and a male one below it, sessile between 2 flattened pedicels, bearing each a rudimentary or barren spikelet, the whole embraced by a sheathing bract, the bracts clustered on the branches of a leafy panicle. Outer glume of the sessile spikelet concave, striate, awnless, 2nd glume acute, awnless, thin but stiff, 3rd very thin and hyaline, 4th or terminal glume very thin and hyaline, entire or bifid at the top, awnless or with a slender twisted terminal awn. Palea very thin or none. Styles distinct. Grain enclosed in the outer glumes, free from them.

A small genus spread over tropical Africa and Asia, the subjoined species a common one, perhaps not indigenous in Australia.

1. **A. mutica**, *Linn.*; *Kunth, Enum.* i. 516.—Stem creeping or climbing, several feet long, with erect branching flowering shoots. Leaves long, usually glabrous. Panicles loose and leafy, 1 to 2 ft. long. Bracts subtending the spikelets 3 to 4 lines long, very concave, striate, with short sometimes awn-like points, in clusters of 5 or 6. Sessile spikelet shorter than the bract; pedicellate spikelets either reduced to a rudimentary glume or more developed and protruding beyond the bract. Awns of the terminal glume very minute or entirely deficient.

N. S. Wales? In *Leichhardt's* collection, without indication of the precise station, and therefore perhaps not really wild.

SUBTRIBE V. TRISTEGINÆ.—Spikelets paniculate, all similar, the terminal glume often small and thin at the time of flowering, but more or less enlarged and stiffened or hardened round the fruit, and usually with an awn twisted and bent as in other *Andropogonæ*, but sometimes very small or deficient.

The few genera collected under the above name have been proposed as a distinct tribe intermediate as it were between *Panicæ* and *Andropogonæ*, but they appear to me to be so much nearer to *Andropogonæ* as to justify their being placed under them as a subtribe. The genera with only 2 empty glumes besides the flowering one have been generally referred to *Agrostidæ*, from which they differ essentially in the articulate pedicel, the outer glumes enclosing the fruit and falling off with it.

35. ARUNDINELLA, Raddi.

Spikelets with 1 terminal hermaphrodite flower and often a second male one below it, in a loose terminal panicle. Glumes 4, the 3 outer ones often pointed but not awned, the 3rd with a palea or a male

flower in its axil; terminal flowering glume smaller, thinner, with a fine awn twisted in the lower part and bent back at or below the middle. Palea smaller. Styles distinct. Grain enclosed in the more or less stiffened glume and palea, free from them.

A tropical or subtropical genus, chiefly Asiatic, with a few African and American species. Of the Australian species one is a common Indian one, the other apparently endemic. Both belong to the section *Acratherum* in which the terminal glume is entire or slightly notched without bristle-like points on each side of the awn.

Outer glume nearly as long as the spikelet, with a short point	1. <i>A. nepalensis</i> .
Outer glume about half the spikelet, with a long point	2. <i>A. Schultzii</i> .

1. ***A. nepalensis*, Trin. Spec. Gram. t. 268.**—An erect glabrous perennial, attaining 6 to 8 ft. Leaves narrow, the ligula short, minutely ciliate. Panicle narrow, dense or loose, erect or slightly spreading, varying from 4 to 6 in. in the smaller specimens to above 1 ft. in luxuriant ones, the lower branches densely clustered. Spikelets all or mostly pedicellate, narrow, about 2 lines long, the 3 outer glumes usually 5-nerved, tapering to short points, the lowest rather shorter than the others, the 3rd rather thinner, with a male flower in its axil. Terminal flowering glume smaller and thinner at the time of flowering, slightly notched with minute obtuse or acute points on each side of the awn not produced into bristles. Palea auriculate on each side near the base.—*Acratherum miliaceum*, Link, Hort. Bot. Berol. i. 230.

N. Australia. Upper Victoria River, *F. Mueller*.

Queensland. Brisbane River, Moreton Bay, *Bailey*; Dry Beef Creek, *Leichhardt*; Rockhampton and neighbourhood, *Thozet, O'Shanesy*; Darling Downs, *Law*; Spring-sure, *Wuth*; Herbert's Creek, *Bowman*; Rockingham Bay, *Dallachy*.

N. S. Wales. Liverpool Plains, *Leichhardt*.

Widely distributed over the hilly districts of tropical Asia, extending to South Africa.

2. ***A. Schultzii*, Benth.**—Stems erect, rather slender but rigid, 3 ft. high or more. Leaves narrow, glabrous except a few long hairs at the orifice of the sheath. Panicle narrow, 3 to 4 in. long in our specimens. Spikelets 2 lines long or rather more, on shorter pedicels than in *A. nepalensis* or almost sessile. Outer glume broad, 3-nerved, scarcely half as long as the spikelet, with an awnlike point nearly as long; 2nd glume as long as the 3rd, 5-nerved, with a short point, 3rd 5- or 7-nerved, thin, with a small bifid palea in its axil; terminal flowering glume thin, about 5-nerved, tapering into a short fine awn, at length bent back about the middle as in the rest of the genus.

N. Australia. Port Darwin, *Schultz*, n. 31.

36. POLYPOGON, Desf.

Spikelets 1-flowered, in a dense spikelike or slightly spreading panicle, the pedicels articulate, with a tuft of short hairs above the articulation; glumes 3, 2 outer empty ones with a terminal straight awn, the terminal flowering glume smaller, thinner, entire or notched, with an awn in the notch or on the back, either twisted at the base and bent back at or below the middle, or small and straight or reduced to a minute point. Palea smaller. Styles short, distinct. Grain enclosed in the slightly stiffened glume and palea, free from them.

A small genus, very widely distributed over the globe. Of the three Australian species two have a wide range over the temperate and subtropical regions of the Old World, although their limits systematic as well as geographical are not yet satisfactorily determined, the third appears to be endemic. The genus is generally placed under Agrostideæ, but the articulation of the pedicel is very conspicuous, and the general structure is almost precisely that of *Garnotia*, from which indeed *Polygogon* only differs in the inflorescence dense and spikelike, not loosely paniculate.

- | | |
|---|------------------------------|
| Awns of the empty glumes 3 or 4 times as long as the glume, of the flowering glume very short or none . . . | 1. <i>P. monspeliensis</i> . |
| All the awns very short | 2. <i>P. fugax</i> . |
| Awn of the flowering glume longer than those of the empty glumes, twisted at the base and bent. Stamen 1 | 3. <i>P. tenellus</i> . |

P. simplex, Spreng. Syst. Cur. Post. 30, said to be Australian on the authority of Sieber's Agrostotheca n. 94, under the name of *Podosæmun*, sp. n. Nees, is unknown to me, the very short diagnosis might apply to *P. maritimus*, DC. and the specimen may not be Australian. It has been named *Trichochloa simplex* by Rœm. and Schult. Syst. Addit. ad Mant. Cl. iii. 577, and *Muehlenbergia simplex* by Kunth, Enum. i. 203, but both authors have merely copied Sprengel's diagnosis.

1. ***P. monspeliensis*, Desf. ; Kunth, Enum. i. 232.**—An annual procumbent at the base or rarely erect, ascending to 1 or 2 ft., glabrous or nearly so. Leaves flat, the ligula rather large. Spikelike panicle cylindrical or slightly branched, very dense, 1 to 3 in. long, often of a yellowish shining green. Spikelets very numerous but almost concealed by the fine awns, the hairs surrounding the spikelet above the articulation few and very short. Outer glumes scarcely 1 line long, pubescent or ciliate, obtuse or notched, the fine straight awn 3 or 4 times as long as the glume. Flowering glume broad, hyaline, truncate or jagged, the awn usually reduced to a short point or entirely wanting. —Hook. f. Fl. Tasm. ii. 117 ; Reichb. Ic. Fl. Germ. t. 31.

N. S. Wales. Port Jackson, *Woolfs* ; Lord Howe's Island, *C. Moore*.

Victoria. Port Phillip and Darebin Creek, *F. Mueller* ; Ballarat, *Bachus* ; Little River, *Fullagar*.

Tasmania. Launceston, *Gunn* ; Southport, *C. Stuart* ; Swanport, *Story*.

S. Australia. Holdfast Bay, *F. Mueller*.

W. Australia, *Drummond* ; Murchison River, *Oldfield*.

The species is common in most temperate and subtropical regions of the Old

World and has also been sent from America, but in many stations and perhaps in most of the Australian ones rather as an introduced weed.

2. *P. fugax*, Nees in Steud. Syn. Glum. i. 184.—Apparently annual, glabrous, 1 to 2 ft. high, with the foliage of *P. monspeliensis*. Spikelike panicle dense, 3 to 4 in. long, larger and more distinctly branched than in *P. monspeliensis*, the shortness of the awns and rather larger spikelets giving it a very different aspect. Outer glumes $1\frac{1}{2}$ to near 2 lines long, scabrous or hispid, with 2 hyaline terminal lobes, the intermediate awn scarcely so long as the glume. Flowering glume not half so long, broad and notched or 2-lobed, the very short awn usually attached on the back a little below the notch.

W. Australia, Drummond; Busselton, Pries.

These specimens have been identified by Munro with the Indian ones described by Nees under the name of *P. fugax*, they also closely resemble some South American specimens of *P. interruptus*, H. B. et K. They can scarcely be considered as a short-awned variety of *P. monspeliensis*, and perhaps come nearer to the similarly short-awned *P. littoralis*, Sm. The latter is however usually a perennial with a smaller spikelike panicle, and the glumes narrow and scarcely 1 line long. A specimen from Ravenswood in Tasmania, in Herb. F. Mueller, is very near the true *P. littoralis*, but is probably only an introduced weed.

3. *P. tenellus*, R. Br. Prod. 173.—Apparently annual, decumbent at the base, ascending from 6 in. to near 2 ft. but usually much more slender than in *P. monspeliensis*, the spikelike panicle narrower, not so dense, rarely 2 in. long. Outer glumes in the typical form scarcely above 1 line long, narrow, entire, ciliate or villous on the keel and margins, tapering into fine straight awns of 2 to 4 lines, the hairs of the pedicel round the base of the spikelet more prominent than in *P. monspeliensis*. Flowering glume much shorter, broad, acute or scarcely notched, the awn attached below the apex, longer than, often twice as long as, those of the outer glumes, twisted in the lower part, bent about the middle. Palea very narrow. Stamen 1.

W. Australia. King George's Sound, R. Brown; Gordon River, Oldfield.

Var. *Drummondii*. Spikelets rather larger, often purplish, scabrous or glabrous except the tuft of hairs surrounding the base. Awn of the flowering glume more than twice as long as the outer awns.—*P. Drummondii*, Steud. Syn. Glum. i. 184.—W. Australia, Drummond 4th. coll. n. 369.

Var. *Oldfieldii*. Spikelike panicle dense. Spikelets small and villous or ciliate as in the typical form but the awns all fine and rather long, those of the outer glumes nearly as long as those of the flowering ones.—Murchison and Bowes Rivers, Oldfield.

TRIBE III. OLYRÆ. — Spikelets 1-flowered, unisexual, the two sexes in the same panicle. Glumes 3, the flowering one large, membranous or hardened and enclosing the grain, the outer ones empty. A palea to all the flowers. Stamens 6, or in genera not Australian 3. Styles more or less united with 2 or 3 long feathery stigmas.—Leaves usually broad and often petiolate above the sheaths.

Besides the Australian genus the tribe comprises a few American ones, the farther study of which may require some modification in the above character. It is clear however that neither *Leptaspis*, nor its nearest ally *Pharus*, can be associated with any other tribe of Gramineæ.

37. LEPTASPIS, R. Br.

Spikelets unisexual, monœcious, 1-flowered, pedicellate in a loose terminal panicle. Glumes 3, the 2 outer empty ones small, broad; 3rd or flowering glume larger, membranous, 5- or 7-nerved, ovoid or globular, open down the inner side in the males, closed in the females except a small terminal but excentrical orifice. Palea small, lanceolate, flat, 2-nerved. No lodicules. Stamens in the males 6 without any rudimentary ovary. No staminodia in the females. Style entire to the orifice of the glume with 3 exserted feathery stigmas. Grain enclosed in the utricular enlarged glume.

A small genus extending over tropical Asia and African, the only Australian species endemic. It is in many respects allied to the American *Pharus*.

1. **L. Banksii**, R. Br. *Prod.* 211.—Stems from a horizontal or shortly creeping rhizome $1\frac{1}{2}$ to 2 ft. high, leafy only in the lower part. Leaves petiolate above the long narrow sheaths, lanceolate, flat, acute, 4 to 8 in. long and $\frac{1}{2}$ to 1 in. broad, glabrous or sprinkled with minute hairs. Panicle very loose, $\frac{1}{2}$ to 1 ft. long, the filiform branches few, distant, spreading, more or less divided. Spikelets distant, pedicellate or 1 or 2 almost sessile on the smaller branchlets, the terminal one of each branchlet usually male, the lower ones female. Outer glumes broad and concave especially in the females, almost black when dry, the largest under 1 line long, the outer one still smaller. Flowering glume nearly globular but open in the males, rather above 1 line diameter, pubescent in the females, 1 line diameter when in flower, 2 lines when in fruit and quite closed except the minute terminal orifice.—*Pharus Banksii*, Spreng. *Syst.* ii. 114.

Queensland. Endeavour River, *Banks* and *Solander*, *A. Cunningham*; Cape York, *Daemel*; Rockingham Bay, *Dallachy*.

TRIBE V. PHALARIDÆ.—Spikelets with 1 terminal hermaphrodite flower and rarely 2 male flowers lower down. Glumes 2 to 6, all keeled or with a central nerve, 2 below the articulation of the rachis empty and persistent, but deficient in several genera, 4 or fewer above the articulation, of which 2 (usually the 2 inner ones) larger and enclosing the grain, 1 or 2 outer ones usually small and empty or deficient, rarely larger and enclosing each a male flower with a palea, but no distinctly 2-nerved palea to the terminal fertile flower. Stamens 6 or fewer.

It has appeared to me that the genera in this tribe form a very distinct group, characterised by the bract immediately enclosing the fertile flower having almost if

not quite always a central nerve, and being therefore probably a glume on the axis of the spikelet and not a palea on the axis of the flower, although, when the flower is apparently terminal, the two axes being confounded into one cannot be distinguished with certainty. The arrangement of the spikelet is thus brought very close to that of *Kyllinga* and *Courtoisia* in Cyperaceæ. It has been objected to me that in *Phalaris* itself the uppermost bract, whether glume or palea, is 2-nerved, and so it appears if seen from the inside, but on the outside there is usually an intermediate angle fringed with a line of hairs which appears to indicate a central nerve and never occurs in the true palea, and the next glume enclosing it, which is really 5-nerved, appears often to be only 2- or 4-nerved if seen from the inside, the central nerve being often very faint and short whilst one on each side is more conspicuous and reaches the apex. In all the other genera the central nerve is very distinct.

38. LEERSIA, Swartz.

(Asprella, Rœm. and Schult.)

Spikelets 1-flowered, flat, articulate on short pedicels along the filiform branches of a terminal panicle. Glumes 2, complicate and keeled, the outer one the largest. No 2-nerved palea. Stamens 6 or in species not Australian 3 or fewer. Styles short, distinct. Grain enclosed in the slightly hardened glumes, free from them.

A small genus, spread over the tropical and temperate regions of the globe, the only Australian species common to the New and the Old World.

1. **L. hexandra**, Swartz.; Kunth, Enum. i. 6.—An erect though weak glabrous grass, attaining several feet, often rooting in the mud at the lower nodes. Leaves rather narrow, flat when fresh, mostly erect. Panicle oblong, 2 to 4 in. long, with erect or slightly spreading filiform flexuose branches. Spikelets narrow-ovate, about $1\frac{1}{2}$ lines long. Glumes membranous, acute, the outer one with a prominent nerve on each side besides the marginal one; the inner glume nearly as long, but narrower, with only one nerve on each side near the margin. Stamens 6.—*L. australis*, R. Br. Prod. 210; *Asprella australis*, Rœm. and Schult. Syst. ii. 267; *L. mexicana*, Kunth, Rev. Gram. t. 1.

Queensland. Keppel Bay, R. Brown; Port Curtis, M^cGillivray; Rockhampton Thozet, O'Shanesy; Brisbane River, Moreton Bay, F. Mueller, Leichhardt and others.

N. S. Wales. Port Jackson, R. Brown.

39. ORYZA, Linn.

Spikelets 1-flowered, flat, articulate on short pedicels or sessile along the flexuose branches of a terminal panicle. Glumes 4, 2 outer ones small, lanceolate, 2 upper ones complicate and keeled, the outer one the largest. No 2-nerved palea. Stamens 6. Styles short, distinct. Grain enclosed in the hardened almost coherent upper glumes, but free from them.

A genus of very few species from the warmer regions of the New and the Old World, the only Australian species of Old World origin, but in very general cultivation.

1. **O. sativa**, *Linn.*; *Kunth*, *Enum.* i. 7.—Stems creeping or floating at the base, ascending to several feet. Leaves long and rather broad, very scabrous especially on the upper side, otherwise glabrous, the ligula prominent scarious and jagged. Panicle narrow, erect, 6 in. to above 1 ft. long. Spikelets ovate-oblong, 3 to 4 lines long. Outer glumes scarcely $\frac{1}{2}$ line long and nerveless, upper ones very prominently nerved, the keels usually ciliate, the outer one with 1 nerve on each side besides the nerve-like margin, closely embracing and almost connate with the inner glume, which is as long but narrower with only 1 nerve on each side near the thin margin, both glumes either shortly awned or in some cultivated varieties awnless or the outer one with a straight awn of $\frac{1}{2}$ to 3 in., and the inner with only a short point.—*F. Muell.* *Fragm.* viii. 115; *Döll.* in *Mart. Fl. Bras. Gram.* t. 1.

N. Australia. Marshes about Hooker and Sturt's Creek, really wild, *F. Mueller*. Common in East India in the wild state (*Roxburgh*), besides the numerous varieties cultivated in various countries under the name of *Rice*.

40. POTAMOPHILA, R. Br.

Spikelets 1-flowered, polygamous, not flattened, articulate on very short pedicels along the filiform branches of a terminal panicle. Glumes 4, 2 outer ones very small membranous, nerveless, 2 upper ones much larger, membranous but prominently nerved, the outer one the broadest. No 2-nerved palea. Stamens 6. Styles short, distinct. Grain enclosed in the larger glumes, free from them.

The genus is limited to the single species endemic in Australia..

1. **P. parviflora**, *R. Br. Prod.* 211.—An aquatic glabrous grass of 3 to 5 ft. Leaves narrow and erect, convolute when dry, scabrous; ligula prominent, jagged. Panicle narrow, 1 to $1\frac{1}{2}$ ft. long or even more. Spikelets very numerous, about $1\frac{1}{4}$ lines long, pale-coloured or purplish, ovoid-oblong, the males and females very similar and variously intermixed, with a few barren ones reduced to empty glumes. Larger glumes membranous, rather acute, concave, the outer one 5-nerved, the inner one 3-nerved.—*Kunth*, *Rev. Gram.* t. 5; *Trin. Spec. Gram.* t. 249.

N. S. Wales. Williams River, *R. Brown*; Hastings River, *Beckler*, the specimens few, and not seen in any other collection.

* 41. EHRHARTA, Thunb.

Spikelets 1-flowered, pedicellate in a terminal panicle rarely reduced to a simple raceme, the rhachis of the spikelet articulate above the 2 outer glumes. Glumes 6, 2 outer persistent, usually small, the 3rd various sometimes awned, the 4th usually the largest and sometimes awned, the 5th rather smaller and the 6th narrower and thinner, both





keeled and never awned. Flower terminal. No palea. Lodicules large, very thin. Stamens 6, rarely 3. Styles short, distinct. Grain enclosed in the larger glumes but free from them.

The genus is limited to South Africa and the Mascarene Islands. The two species subjoined have evidently been introduced into Australia.

- | | |
|--|---------------------------|
| Spikelets about 4 lines long without the awns ; 3rd and 4th
glumes rigid, prominently nerved, awned | 1. <i>E. longiflora</i> . |
| Spikelets about 2½ lines long ; not awned ; 3rd glume
short, very thin, 4th faintly nerved rather more
rigid | 2. <i>E. brevifolia</i> . |

* 1. *E. longiflora*, *Sm. Ic. Ined.* t. 32.—An erect glabrous grass, attaining 2 or 3 ft. but often much smaller. Leaves flat, sometimes rather long, slightly scabrous. Panicle loose, narrow, 3 to 6 in. long, the branches and pedicels filiform. Outer persistent glumes obtuse, 2 to 3 lines long, often purplish, the 2nd rather longer than the first, 3rd and 4th glumes 3 to 4 lines long, scabrous-pubescent, rigid, 3-nerved, tapering into an awn as long as themselves, and each with a tuft of hairs at their base on the slightly elongated rhachis, the 4th contracted into a short stipes, 5th and 6th glabrous, unawned. Stamens 6, or rarely in a few flowers reduced to 5 or 4.—Swartz in *Trans. Linn. Soc.* vi. 56, t. 4 ; Kunth, *Enum.* i. 14.

W. Australia. Naturalised about King George's Sound, *F. Mueller*.
Victoria. Now wild on the Wimmera, *F. Mueller*.

A native of South Africa introduced into the island of St. Helena on one side as into Australia on the other.

* 2. *E. brevifolia*, *Schrad. ; Kunth, Enum.* i. 13.—Stems from a shortly creeping or tufted base about 1 ft. high. Lower leaves rarely above 1 in. long, upper ones few with long sheaths, all glabrous. Panicle loose, shortly branched or almost reduced to a raceme, 3 to 5 in. long, the pedicels and branches filiform. Spikelets nearly 2½ lines long, the outer persistent glumes nearly equal, rather obtuse, not much shorter than the spikelet, 3rd glume very thin, obtuse, ciliate, about half the length of the spikelet, with a callosity on each side at the base but no tuft of hairs, 4th and 5th thin but rather more rigid, sprinkled with a few long hairs, the 4th the largest tapering into a short point, the 5th rather shorter and acute, the 6th enclosing the flower scarcely half as long. Stamens not seen in the Australian specimens the grain being nearly ripe, 6 in the African plant.

W. Australia, *Drummond, n.* 142. The specimens seen rather numerous but unaccompanied by any memoranda. I can find nothing to distinguish them from the South African *E. brevifolia*, and therefore conclude them to represent an introduced plant. Although the number of stamens is not known the inflorescence is that of *Ehrharta* not of *Tetrarrhena*.

42. MICROLÆNA, R. Br.

(Diplax, Hook. f.)

Spikelets 1-flowered, on filiform pedicels in a narrow loose panicle, the rhachis of the spikelet articulate above the 2 outer glumes. Glumes 6, 2 outer short and persistent, 3rd and 4th long narrow and awned, 5th and 6th shorter acute unawned, all keeled. Flower terminal. No palea. Lodicules large, very thin. Stamens 4 or 2. Styles distinct. Grain enclosed in the larger glumes but free from them.

A small genus, confined to Australia and New Zealand, one of the Australian species common to New Zealand, the other endemic.

The genus is closely allied to *Tetrarrhena*, differing in the loose inflorescence and awned glumes. The tufts of short cilia at the base of the 3rd and 4th glumes are not in *Tetrarrhena*, but are often very much reduced in *Microlæna tasmanica*.

Stamens 4. Rhachis of the spikelet slightly elongated between the 3rd, 4th and 5th glumes 1. *M. stipoides*.

Stamens 2. Glumes all close above each other 2. *M. tasmanica*.

1. **M. stipoides**, R. Br. *Prod.* 210.—Stems from a perennial rhizome erect or ascending, 1 to 2 ft. high. Leaves usually rather short, flat or convolute and very acute, glabrous or slightly hairy. Panicle narrow, 3 to 6 in. long, with filiform erect branches and pedicels. Spikelets narrow, 4 to 5 lines long without the awn, 2 outer persistent glumes minute; 3rd and 4th glumes narrow, rigid, with 3 prominent scabrous nerves, tapering into a fine awn, with a tuft of hairs at their base on the slightly elongated rhachis, the 4th rather longer than the 3rd and its awn sometimes much longer, 5th glume rather shorter, acute but not awned, the nerves not prominent, 6th shorter very narrow and thin but stiff. Stamens 4.—Hook. f. *Fl. Tasm.* ii. 105; *Ehrharta stipoides*, Labill. *Pl. Nov. Holl.* i. 91, t. 118; F. Muell. *Fragm.* vii. 90; *Microlæna Gunnii*, Hook. f. l. c. 105, t. 155, A.

Queensland. Brisbane River, *Bailey*; Darling Downs, *Leichhardt*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolfs* and others; Macleay River, *Beckler*; New England, *C. Stuart*.

Victoria. Yarra River, *F. Mueller*; Ballarat, *Bacchus*.

Tasmania. Launceston, *Gunn*; Cheshunt, *Archer*; Huon River, *Oldfield*; Southport, *C. Stuart*; Swanport, *Storcy*.

S. Australia. Round St. Vincent's Gulf, *F. Mueller*.

W. Australia. *Drummond*, n. 395; Blackwood River, *Oldfield*; Busselton, *Pries*.

Also in New Zealand.

2. **M. tasmanica**, Hook. f.—Stems from a tufted or shortly creeping base erect, slender, mostly under and rarely much above 1 ft. high. Leaves at the base of the stem short, narrow but flat, on the stem very few with short laminæ far below the panicle. Panicle loose, pyramidal

or narrow, 2 to 3 in. long, the pedicels and short branches filiform. Outer persistent glumes unequal, the lowest $\frac{1}{2}$ to $\frac{3}{4}$ line, the 2nd 1 to $1\frac{1}{2}$ lines long, the 3 next glumes almost close above the outer ones with very short and few hairs at their base, narrow, acute, 3 to 4 lines long, prominently 5-nerved, the 3rd with a short point or glume, the 4th rather longer with an awn sometimes as long as the glume, the 5th acute but not awned, 6th or flowering glume shorter, keeled, faintly nerved. Stamens (always ?) 2.—*Diplax tasmanica*, Hook. f. Fl. Tasm. ii. 105, t 155, B; *Ehrharta diarrhena*, F. Muell. Fragm. vii. 89.

Tasmania. Recherche Bay, Gunn; South Port, C. Stuart.

Var. *subalpina*, F. Muell. Leaves rather longer. Stem short. Spikelets smaller than in the typical form.—Halfway up Mount Lapeyrouse, Oldfield; Lake St. Clair, Gulliver.

43. TETRARRHENA, R. Br.

Spikelets 1-flowered, sessile or very shortly pedicellate in a simple spike or in a scarcely branched spikelike panicle, the rhachis of the spikelet articulate above the 2 outer glumes. Glumes 6, 2 outer small and persistent, the 3rd various, the 4th usually the largest and rigid, the 5th similar but usually smaller, the 6th narrower but keeled like them, none of them awned. Flower terminal. No palea. Lodicules large, very thin. Stamens 4. Styles short, distinct. Grain enclosed in the larger glumes but free from them.

The genus is limited to Australia. It is closely allied to the South African *Ehrharta*, with which F. Mueller, following Sprengel, unites this and the preceding genus, but the dimerous not trimerous androecium, together with the geographical range, appear sufficient to maintain them as distinct.

Larger glumes obtuse or scarcely acute.

Third glume about half as long as the 4th. Stems from a creeping base ascending to about 1 ft. . . . 1. *T. distichophylla*.

Third glume nearly as long as the 4th and 5th.

Stems long and weak, at length very long branching and entangled. Outer glumes obtuse, unequal 2. *T. juncea*.

Stems erect. Outer glumes acute, nearly equal. Western species 3. *T. laevis*.

Larger glumes acutely acuminate 4. *T. acuminata*.

1. ***T. distichophylla***, R. Br. *Prod.* 210.—Stems tufted or branching and creeping at the base to a great extent, ascending to from 6 in. to above 1 ft., rather rigid but slender. Leaves chiefly at the base or on decumbent branches, short, almost distichous, slightly hairy. Spike simple or scarcely compound, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long. Spikelets almost distichous, sessile or nearly so, sometimes clustered in the lower part of the spike, $2\frac{1}{2}$ or at length 3 lines long, glabrous or minutely pubescent. Outer glumes very short thin and faintly nerved, 3rd glume scarcely more than half the length of the spikelet, thin, obtuse and

faintly nerved, 4th and 5th nearly equal, broad, obtuse, 7-nerved, the nerves more prominent on the 4th than on the 5th, 6th glume enclosing the flower narrow, concave, faintly 1-nerved.—Hook. f. Fl. Tasm. ii. 104; *Ehrharta distichophylla*, Labill. Pl. Nov. Holl. i. 90, t. 117.

Victoria. Between Gillibrand and Curdie's Rivers, *F. Mueller*.

Tasmania. Port Dalrymple, *R. Brown*; Hobarton and Penquite, *Gunn*; Southport, *C. Stuart*.

2. ***T. juncea***, *R. Br. Prod.* 210.—Stems either long slender and slightly branched or more branched and entangled scrambling over bushes to the height of 8 to 12 ft. (*F. Mueller*). Leaves narrow, glabrous or pubescent with short rigid hairs. Spike or raceme simple, 1 to 2 in. long, the rachis flexuose. Spikelets distant, sessile or nearly so, 2 to 2½ lines long. Two outer glumes short but unequal, obtuse, faintly nerved; 3rd glume nearly equal to the 4th and 5th, all three obtuse, prominently 3- or 5-nerved, 6th glume enclosing the flower very narrow and hyaline.—*Ehrharta juncea*, Spreng. Syst. ii. 114; *Tetrarrhena tenacissima*, Nees in Hook. Lond. Journ. ii. 409; Hook. f. Fl. Tasm. ii. 104, t. 154; *Ehrharta tenacissima*, Steud. Syn. Glum. i. 7; *F. Muell. Fragm.* vii. 90.

Victoria. Port Phillip, *R. Brown*; Dandenong Ranges, *F. Mueller*; Mount William, *Sullivan*; Red Jacket Creek, *Gargurevich*.

Tasmania. Moist places near the sea, Black River, *Gunn*.

Var. *scabra*. Leaves very scabrous. Outer glumes rather longer than in the typical form but of the same number, the specimens just coming into flower the 5th glume is still concealed within the 4th.—*Ehrharta unglumis*, *F. Muell.* in Trans. Phil. Soc. Vict. i. 111.—Victoria, *F. Mueller*. The plant referred to by *F. Muell.* l. c. as *E. contexta*, is the typical form of *Tetrarrhena juncea*.

3. ***T. lævis***, *R. Br. Prod.* 210.—Stems from a shortly creeping or horizontal rhizome 1 to 2 ft. high. Leaves flat, glabrous and smooth or slightly scabrous. Spike loose, simple or with a few very short branches, 1½ to 3 in. long. Spikelets about 3 lines long, sessile or shortly pedicellate, glabrous. Outer persistent glumes rigidly membranous, rather acute, nearly equal, the lowest slightly the 2nd prominently 5-nerved, 3rd, 4th and 5th glumes nearly similar, obtuse, the nerves faint, disappearing as the glumes thicken, the 3rd rather shorter and more open, the 4th and 5th closely enveloping the grain, the 6th small, narrow and hyaline, faintly 1-nerved.—*Ehrharta lævis*, Spreng. Syst. ii. 115; *Tetrarrhena Drummondiana*, Nees in Hook. Lond. Journ. ii. 409.

W. Australia. King George's Sound, very common, *R. Brown*, *Preiss*, n. 1845, *Drummond*, n. 394, *Oldfield*, *F. Mueller* and others; Swan River, *Drummond*, 1st. coll.

4. ***T. acuminata***, *R. Br. Prod.* 210.—Stems long and slender. Leaves usually rather longer and broader than in *T. distichophylla*, quite glabrous. Spike 1 to 1½ in. long. Spikelets few, distant, sessile, 3 to

4 lines long. Outer persistent glumes very small as in *T. distichophylla*, but not so obtuse, the lowest about $\frac{1}{2}$ line, the 2nd $\frac{3}{4}$ line long, 3rd and 4th glumes narrow, rigid, acuminate, with about 5 very prominent scabrous or almost muricate nerves, the 4th rather longer than the 3rd and sometimes produced into a short fine point; 5th glume rather shorter and less acute, rigid but faintly nerved and smooth or nearly so, 6th shorter and narrower, but keeled acute and rather rigid.—Hook. f. Fl. Tasm. ii. 104; *Ehrharta acuminata*, Spreng. Syst. ii. 114.

Victoria. Queen's Cliff, *F. Mueller*.

Tasmania. Port Dalrymple, *R. Brown*; Longford, *Archer*; Mersey River, *C. Stuart*.

44. ALOPECURUS, Linn.

Spikelets 1-flowered, flat, densely crowded into a cylindrical spike or spikelike panicle. Glumes 3, 2 outer complicate, keeled, acute but not awned, 3rd under the flower shorter, keeled, with a short slender dorsal awn. No 2-nerved palea or lodicules. Stamens 3. Styles distinct. Grain enclosed in the scarcely hardened glumes, but free from them.

A small genus, widely spread over the temperate and colder regions of both the northern and the southern hemispheres, only penetrating into the tropics as occasional weeds. The two Australian species are common northern ones, and one of them is only as an introduced weed.

Outer glumes nearly 3 lines long, united at the middle,
glabrous or nearly so

1. *A. agrestis*.

Outer glumes not $1\frac{1}{2}$ lines long, free or scarcely united at
the base, hairy on the keel

2. *A. geniculatus*.

* 1. *A. agrestis*, Linn.; *Kunth*, Enum. i. 23.—An annual, 1 to 2 ft. high. Leaves rather short, with long not very loose sheaths. Spikes 2 to 3 in. long, the spikelets not so closely packed nor so much flattened as in other species, about 3 lines long, usually quite glabrous, the 2 outer glumes united to about the middle, the hairlike awn of the flowering glume projecting 2 or 3 lines beyond them.—Reichb. Ic. Fl. Germ. t. 49.

Tasmania. Swanport, *Story*, evidently introduced.

2. *A. geniculatus*, Linn.; *Kunth*, Enum. i. 24, ii. t. 7.—A perennial or sometimes annual only, glabrous except the spike. Stems usually procumbent at the base, bending upwards at the lower nodes, sometimes only 3 or 4 in., often 1 ft. high or more. Leaves narrow, the upper sheaths broad and loose. Spike 1 to 2 in. long, closely imbricate but slender. Outer glumes hairy on the keel, scarcely pointed, usually but little more than 1 line long, free or scarcely united at the base, the hairlike awn of the flowering glume not projecting

above 1 line beyond them.—Reichh. Ic. Fl. Germ. t. 49; Hook. f. Fl. Tasm. ii. 109; F. Muell. Fragm. viii. 138; *A. australis*, Nees in Hook. Lond. Journ. ii. 412.

Queensland. Darling Downs, *Law*; Ballandool River, *Locker*.

N. S. Wales. In the interior, west of the Blue Mountains, Darling River, etc., *A. Cunningham*, *Mitchell*, *Woolts* and others.

Victoria. Wendu Vale, *Robertson*; Mitta-Mitta, *F. Mueller*; Wimmera, *Dallachy*.

Tasmania. Formosa, *Gunn*.

S. Australia. Spencer's and St. Vincent's Gulfs to the Murray, *F. Mueller* (with longer awns than usual).

W. Australia. Champion Bay, *Oldfield*.

Common in the temperate regions of the northern hemisphere, and as an introduced weed in the southern hemisphere and in some places within the tropics. Perhaps truly indigenous in Australia and New Zealand.

45. PHALARIS, Linn.

Spikelets 1-flowered, flat, densely crowded in an ovoid or cylindrical spike or spikelike panicle, the rhachis of the spikelet articulate above the outer glumes. Glumes usually 6, 2 outer larger ones thin, complicate, 3-nerved, the keel bordered by a scarious wing, the 3rd and 4th small lanceolate or reduced to small bristles or one deficient, the 5th smaller, complicate, very finely 5-nerved or apparently 4-nerved, the central nerve short and scarcely conspicuous enveloping the 6th glume which is also complicate, enclosing the flower, apparently 2-nerved, but the external angle between the nerves longitudinally ciliate. No ordinary palea. Stamens 3. Styles distinct. Grain enclosed in the 2 upper glumes.

A small genus, chiefly from the Mediterranean and neighbouring regions. The two following species are both northern, one of them certainly, the other possibly, introduced into Australia.

Wings of the outer glumes narrow and thin. Intermediate small glumes reduced to a single small bristle . . . 1. *P. minor*.

Wings of the outer glumes rather broad and white. Intermediate small glumes 2, lanceolate, more than $\frac{1}{2}$ the inner ones 2. *P. canariensis*.

1. ***P. minor***, *Retz*; *Kunth*, *Enum.* i. 32.—An erect glabrous leafy annual, of 1 to 2 ft. or rather more, the upper leaf-sheaths loose, the ligula rather large and scarious. Spikelike panicle very dense and compact, from ovoid-oblong and 1 in. long, to oblong-cylindrical and 2 in. long. Spikelets ovate, nearly 3 lines long, the outer glumes very acute, with narrow dorsal wings. Small intermediate glumes reduced to a single short bristle, sometimes quite minute. Inner glumes slightly pubescent, shorter than the outer ones.—*Trin. Spec. Gram.* t. 79.

Victoria. Melbourne, *Adamson*.

Tasmania. Coal River, *Oldfield*; Swanport, *Story*; Launceston, *Hannaford*.



S. Australia. St. Vincent's Gulf, *Story*.

The species is common in the Mediterranean region and appears in some other countries, but mostly and perhaps in Australia only as introduced. Sibthorp's figure of *P. aquatica*, Fl. Græc. t. 57, usually cited, after Parlatore, for *P. minor*, represents a perennial with a spike twice as long as any I have seen of *P. minor*.

* 2. **P. canariensis**, *Linn.*; *Kunth, Enum.* i. 31.—An annual like *P. minor*, but usually taller, the spikelike panicle shorter broader and more ovoid. Spikelets much broader, the wings of the outer glumes broader and whiter, the intermediate glumes equal, lanceolate, pubescent, more than half as long as the inner ones and the inner ones much more villous than in *P. minor*.—Sibth. Fl. Gr. t. 55.; *Trin. Spec. Gram.* t. 74.

S. Australia. Naturalised on the sea-shore at *Bremerhaven*, *Herb. F. Mueller*.

The plant is much cultivated in the Mediterranean region as *Canary-seed*, and is probably a native rather of South Europe or North Africa than of the Canary Islands, but it has now established itself in so many places, especially near the sea, that it is difficult to say where it is really indigenous.

* 46. **ANTHOXANTHUM**, *Linn.*

Spikelets 1-flowered, narrow, pedicellate, crowded into a cylindrical spike or spikelike panicle, the rhachis articulate above the 2 outer glumes. Glumes 6, 2 outer acute, keeled, 3rd and 4th shorter, empty, narrow, one with a small dorsal awn, the other with a longer awn free from much lower down, 5th broad, obtuse, hyaline, with 3 very fine nerves, enveloping the 6th, which is narrower, with a very fine central nerve or keel, enclosing the flower. No 2-nerved palea. Stamens 2. Styles distinct. Grain enclosed in the 2 upper glumes.

The genus consists of a single species common in the temperate regions of the northern hemisphere, and introduced into several parts of the southern.

* 1. **A. odoratum**, *Linn.*; *Kunth, Enum.* i. 38, ii. t. 8.—A rather slender erect perennial, 1 to 2 ft. high, quite glabrous. Spikelike panicle $1\frac{1}{2}$ to 2 in. long. Spikelets about 3 lines long, the outer glumes unequal, the 3rd and 4th usually quite included within them or rarely the longest awn slightly protruding.—*Trin. Spec. Gram.* t. 14; *Reichb. Ic. Fl. Germ.* t. 106.

N. S. Wales. Port Jackson, *Woolfs*.

Tasmania. New Norfolk, *Gunn*; Swanport, *Story*.

A common meadow grass in Europe and northern Asia, giving the sweet scent to hay. In Australia evidently introduced only.

47. **HIEROCHLOA**, *Gmel.*

(*Disarrhenum*, *Labill.*)

Spikelets with 1 terminal hermaphrodite flower and 2 male flowers below it, in a pyramidal or narrow terminal panicle, the rhachis

articulate above the 2 outer glumes. Glumes 6, thinly scarious, 2 outer acute keeled with a more or less distinct short nerve on each side, 3rd and 4th obtuse or emarginate, the keel sometimes produced into a short awn, each enclosing a narrow palea and 3 stamens, 5th shorter broad obtuse 5-nerved the keel rarely produced into a short point, enveloping the 6th which is narrower with a central nerve or keel. No 2-nerved palea to the terminal flower. Stamens 2. Styles distinct. Grain enclosed in the 2 upper glumes.

An Arctic and Antarctic genus common to the New and the Old World, extending into more temperate regions in Europe, South Africa, the Himalayas and Mexican mountains. Of the two Australian species one has a wide Antarctic range, the other is endemic. The species have all the sweet hay-scent of *Anthoxanthum*.

- Spikelets crowded on the branches of the panicle. Outer glumes as long as the male ones 1. *H. redolens*.
Spikelets all on slender pedicels. Outer glumes shorter than the male ones 2. *H. rariflora*.

1. ***H. redolens*, R. Br. Prod. 209 (by reference).**—Stems tufted, erect, branching, leafy, 2 to 3 ft. high. Leaves flat, rather rigid, slightly scabrous, otherwise glabrous, the ligula scarious, entire. Panicle rather dense, secund or nodding, 4 to 10 in. long in the larger forms, the spikelets crowded along the primary branches, forming spikelike secondary panicles of 1 to $1\frac{1}{2}$ in., the upper ones sessile, the lower distant on clustered filiform peduncles. Glumes all thin, almost hyaline, rather shining; outer empty ones in the typical form about 3 lines long, the short lateral nerve on each side more prominent in the 2nd than in the outermost one. 3rd and 4th glumes each with a male flower, nearly as long as the outer ones, ciliate on the margins and keels, with a short awn arising from a little below the tip, the rhachis of the spikelet shortly lengthened between and above the male glumes. 5th and 6th glumes enclosing the grain obtuse and perfectly glabrous, or the 5th slightly hairy at the end with the keel produced into a minute point.—Hook. f. Fl. Tasm. ii. 108; *Holcus redolens*, Forst. Prod. 92; *Melica magellanica*, Desv. in Lam. Dict. iv. 72; *Disarrhenum antarcticum*, Labill. Pl. Nov. Holl. ii. 83, t. 232; *Hierochloa antarctica*, R. Br. Prod. 209; Brongn. in Duperr. Voy. t. 23; Kunth, Rev. Gram. t. 203.

Victoria. Common in the Australian Alps, *F. Mueller*.

Tasmania. Table Mountain (Mount Wellington) *R. Brown*. Common in wet places throughout the island, *J. D. Hooker* and others.

Also in New Zealand and Antarctic America. Among the several specific names Forster's is the oldest and was applied to the typical New Zealand plant, which appears precisely to correspond with the larger Victorian and some of the Fuegian ones. The slight differences pointed out by Brown do not hold good on our specimens. The following two varieties are however much more distinct, and if the differences are confirmed by further specimens they might be restored as distinct species.

Var? *submutica*, *F. Muell*. Glumes all smaller and more obtuse, those under the male flowers less ciliate and without any or only minute rudimentary awns.—*H.*

submutica, F. Muell. in Trans. Vict. Inst. 1855, 48.—Cobberas and Munyang Mountains, F. Mueller.

Var? *Fraseri*. A smaller plant and more slender than the typical form. Panicle not so dense, usually only 2 to 3 in. long. Pedicels slightly hairy. Spikelets scarcely 2 lines long, the glumes under the male flowers less ciliate, the awns short, but inserted near the apex of the glume.—*H. Fraseri*, Hook. f. Fl. Ant. i. 93; *H. borealis*, Hook. f. Fl. Tasm. ii. 108, scarcely of Schrader, referred to *H. alpina* by Hook. f. Handb. N. Zeal. Fl. 322 and by F. Muell. Fragm. viii. 138.—Mount Wellington, *Fraser*, *Gunn*; Mount Lapeyrouse, *Gulliver*; Mount Field East, F. Mueller.

This appears to me to be closely connected with *H. redolens* through the var. *submutica*. It is certainly near the northern *H. borealis*, but has not the loose divaricate panicle nor the broader spikelets of that species. The northern *H. alpina* differs still more in its small compact panicle and in the awns free from much lower down on the male-flower glumes. All however are very near to each other.

2. **H. rariflora**, Hook. f. Fl. Ant. i. 93; Fl. Tasm. ii. 108. t. 157. —Stems slender, branching, 2 to 3 ft. high. Leaves narrower than in *H. redolens*, tapering into long subulate points. Panicle loose and spreading, 2 to 3 in. long. Spikelets all on slender pedicels, often variegated from the contrast of the purplish outer glumes and pale coloured upper ones. Outer persistent glumes broad, obtuse, the lowest about $1\frac{1}{2}$ lines long, the 2nd rather larger and 3-nerved; intermediate male glumes about 2 lines long, rather rigid, 5-nerved, obtuse and awnless, finely and shortly ciliate on the margins and sometimes on the keel, 5th glume very broad, thin, obtuse, glabrous, 5-nerved, 6th much narrower, keeled, but the lateral nerves scarcely visible.—F. Muell. Fragm. viii. 138.

N. S. Wales. Twofold Bay, F. Mueller.

Victoria. Nanatta and White Rock Mountains, F. Mueller.

Tasmania. Northern parts of the island, *Gunn*; St. Paul's River, C. Stuart; Swanport, *Story*; Bay of Fires, *Bissill*.

The King George's Sound station, given on the authority of Baxter's specimen so marked in Herb. Hook. is probably a mistake. Baxter collected chiefly at King George's Sound, Lucky Bay, and along the coast a little to the eastward, but also a few specimens on the coast of Victoria, which got mixed with his other plants in the general designation of King George's Sound.

TRIBE V. STREPTATHERÆ.—Spikelets with 1, 2, or in a few genera several hermaphrodite flowers, and very rarely a male flower above or below, the rhachis of the spikelet usually articulate above 2 outer persistent empty glumes, either not continued beyond the solitary or upper flower, or produced into a short bristle or rarely bearing one or more upper empty glumes. Flowering glume usually bearing a terminal or dorsal bent awn twisted below the bend, but very small and straight or deficient in a few species. Palea usually thin and small, always 2-nerved, minute or deficient in a few species, large and prominently 2-keeled in a few genera. Stamens never more than 3.

Munro is inclined to raise the three subtribes here proposed to the rank of tribes;

it appears to me however that the three together form a group bearing the same relation to Festucaceæ which the Andropogoneæ do to Paniceæ, the chief character residing in the twisted awn and the generally reduced palea. In neither case can any distinct line be drawn without the interposition of one or two exceptional genera or species.

SUBTRIBE I. STIPACEÆ.—Spikelets 1-flowered, paniculate, the rhachis not produced beyond the flower. Flowering glume closely enveloping the palea, with a terminal simple or trifid awn. Lodicules (always?) 3. Grain usually narrow, enclosed in the more or less hardened glume.

48. **ARISTIDA**, Linn.

Spikelets 1-flowered, on filiform pedicels or nearly sessile in a terminal panicle, the rhachis of the spikelet articulate above the 2 outer glumes. Glumes 3, narrow, 2 outer usually persistent, keeled empty and unawned; terminal or flowering glume narrow, rigid, rolled round the flower, entire, with a terminal trifid awn. Palea small, enclosed in the flowering glume. Styles distinct. Grain narrow, enclosed in the hard upper glume but free from it, the whole falling off with the stipes and awn as in *Stipa*.—All the Australian species glabrous, with convolute more or less subulate leaves.

The genus is widely spread over the tropical and some temperate regions of the New and the Old World. Of the nine Australian species, one, the least spread in Australia, is a common tropical one at least in the Old World, the other eight appear to be endemic. Distinct as are the two sections which are regarded by some as genera, the Australian species of each section run much into each other, and are distinguished by little beyond the proportionate dimensions of the parts of the inflorescence and spikelets.

SECTION I. Arthratherum.—Awn articulate on the glume, entire and spirally twisted below the branches. Flowering glume much shorter than the outer ones.

- | | |
|---|-----------------------------|
| Awn 2 to 3 in. long below the branches, which are at least as long | 1. <i>A. hygrometrica</i> . |
| Awn about $1\frac{1}{2}$ in. below the branches, which vary from $1\frac{1}{4}$ to $2\frac{1}{2}$ in. | 2. <i>A. stipoides</i> . |
| Awn $\frac{1}{2}$ to $\frac{3}{4}$ in. below the branches, which vary from 1 to 3 in. | 3. <i>A. arenaria</i> . |

SECTION II. Chætaria.—Awn not articulate and divided to the glume into 3 branches, the glume itself when barren sometimes twisted but not the awn. Flowering glume about as long or longer than the outer ones.

- | | |
|---|--------------------------|
| Panicle short broad and dense. Glumes $\frac{1}{2}$ in. long. Awns long | 4. <i>A. Behriana</i> . |
| Panicle-branches very long, at length spreading, with few spikelets on long pedicels. Glumes at least $\frac{1}{2}$ in. long | 5. <i>A. leptopoda</i> . |
| Panicle loose, at length pyramidal. Pedicels short. Outer glumes 2 to 3 lines long; flowering glume much longer. Awns short | 6. <i>A. vagans</i> . |
| Panicle narrow, rather loose. Outer glumes as long as the flowering one. | |
| Glumes scarcely 3 lines. Awns under $\frac{1}{2}$ in. long . . . | 7. <i>A. ramosa</i> . |
| Glumes 4 to 5 lines. Awns $\frac{3}{4}$ to 1 in. long | 8. <i>A. calycina</i> . |





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